Original Instructions

OPERATING MANUAL

MAZATROL PREVIEW

Manual No.: H798SA0018E

Serial No.:

Before using this machine and equipment, fully understand the contents of this manual to ensure proper operation. Should any questions arise, please ask the nearest Mazak service center.

IMPORTANT NOTICE

1. Be sure to observe the safety precautions described in this manual and the contents of the safety plates on the machine and equipment. Failure may cause serious personal injury or material damage. Please replace any missing safety plates as soon as possible.
2. No modifications are to be performed that will affect operation safety. If such modifications are required, please contact the nearest Mazak service center.
3. For the purpose of explaining the operation of the machine and equipment, some illustrations may not include safety features such as covers, doors, etc. Before operation, make sure all such items are in place.
4. This manual was considered complete and accurate at the time of publication, however, due to our desire to constantly improve the quality and specification of all our products, it is subject to change or modification. If you have any questions, please contact the nearest Mazak service center.
5. Always keep this manual near the machinery for immediate use.
6. If a new manual is required, please order from the nearest Mazak service center with the manual No. or the machine name, serial No. and manual name.

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- MEMO -

1 OPERATING PANEL

1-1 Name of CNC Operating Panel

1-1-1 Name of CNC operating panel (HG series)

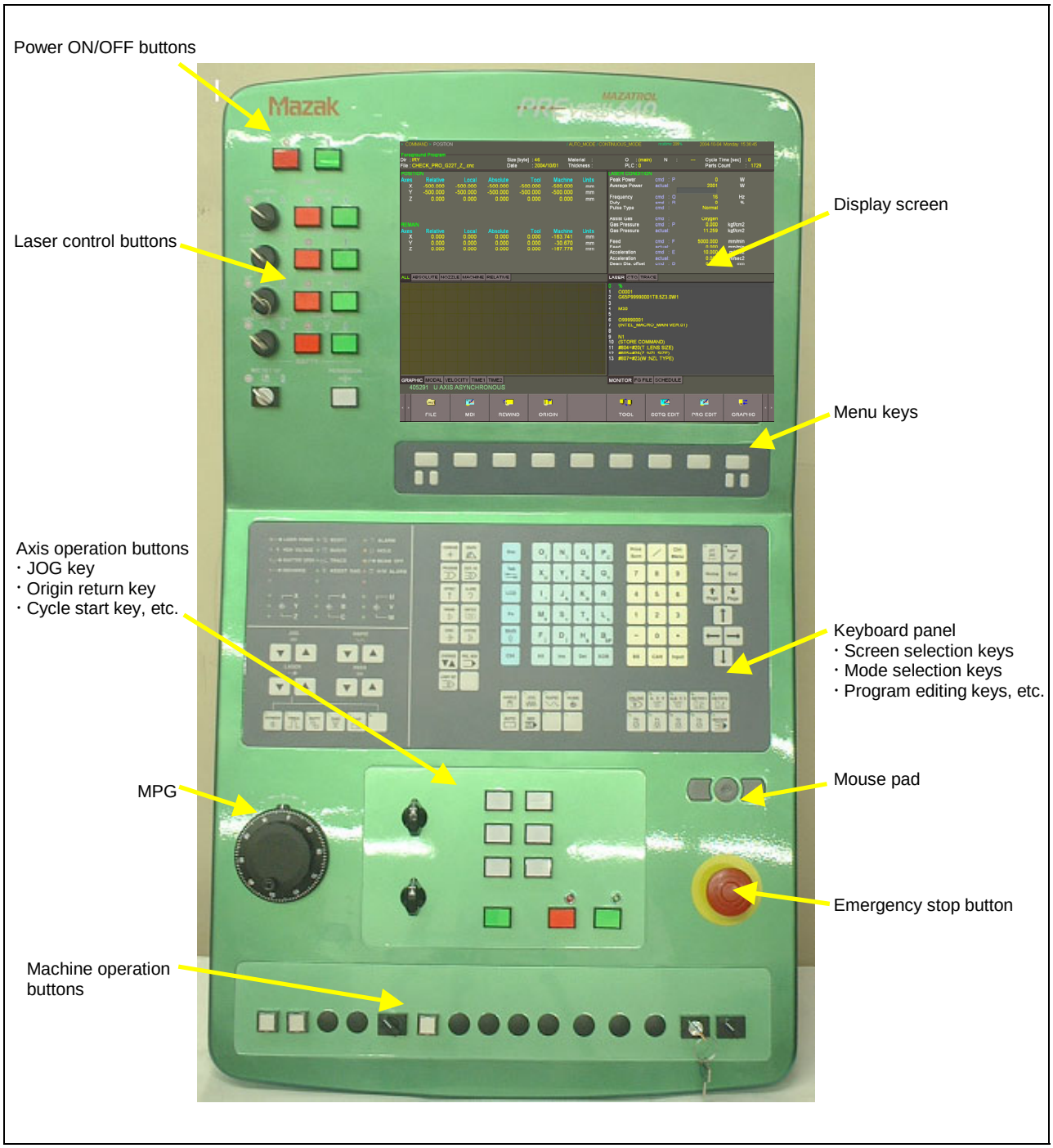


Fig. 1-1 Operating panel (HG series)

1-1-2 Name of CNC operating panel (HTX/STX series)

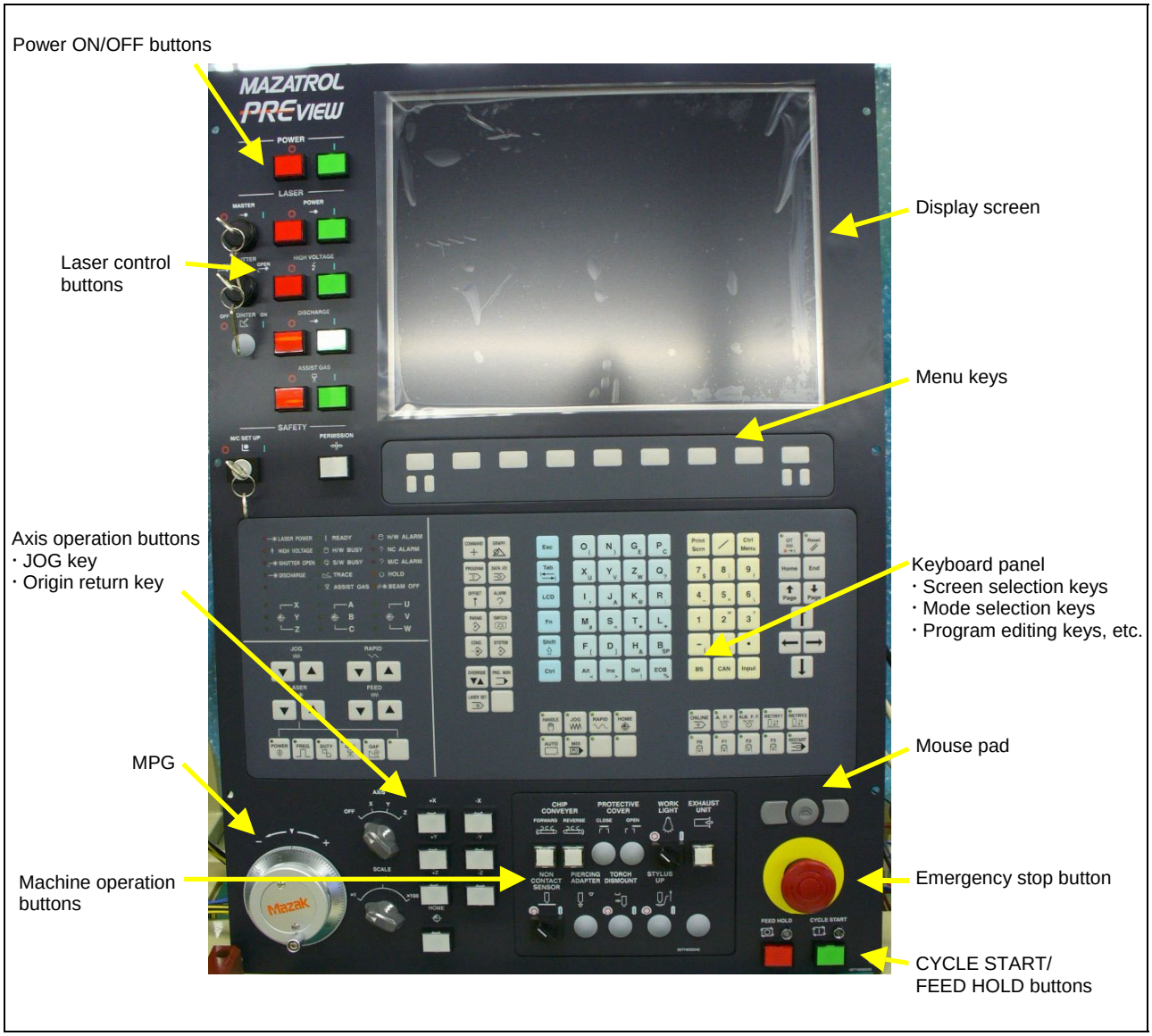


Fig. 1-2 Operating panel (HTX/STX series)

1-2 Keyboard Panel

The major keys used for CNC operation are arranged on the keyboard panel. The keys are used for such as selecting the NC mode, selecting the display screen and editing a program. The LEDs on this panel indicate the machine status.

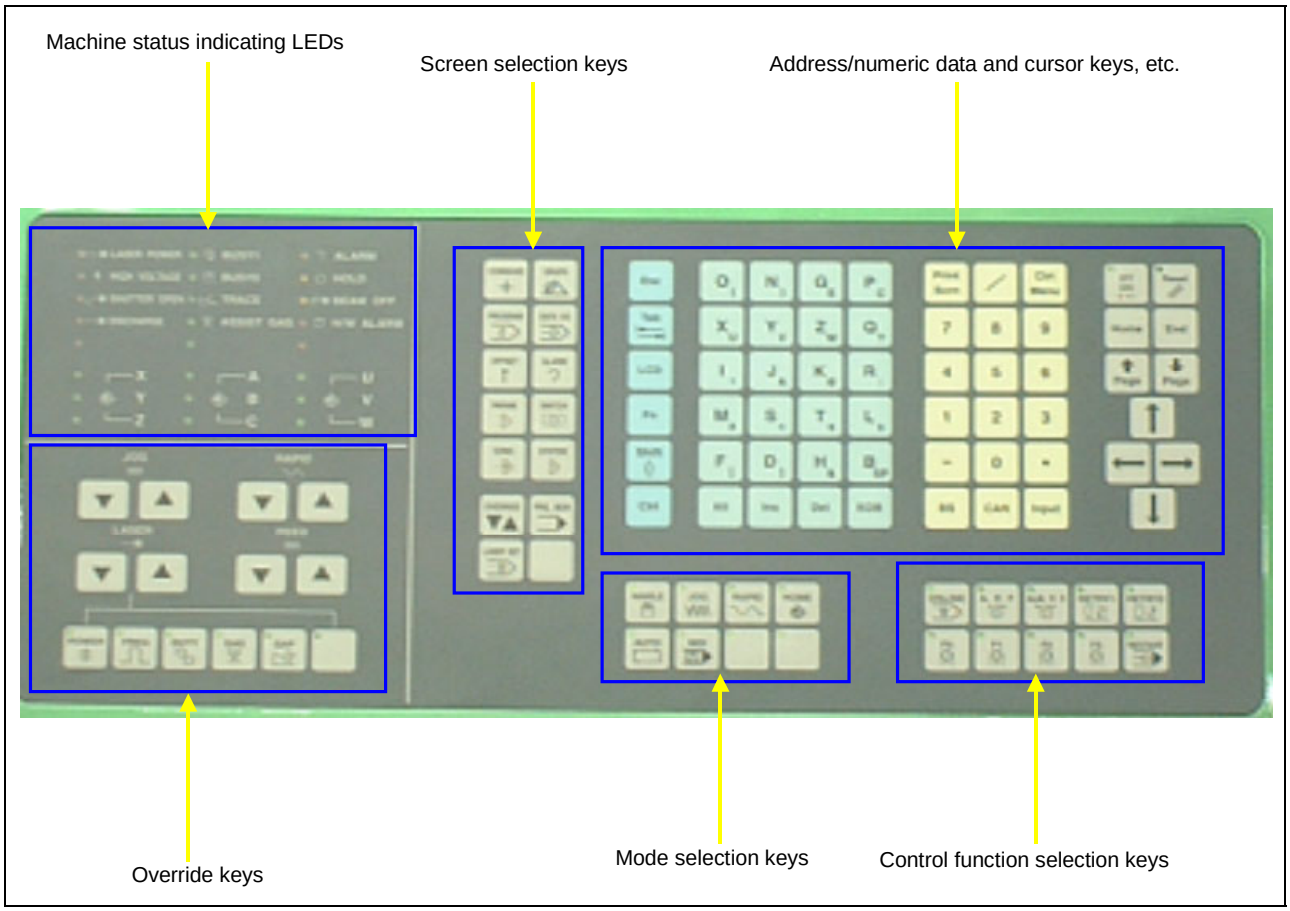


Fig. 1-3 Keyboard panel

- MEMO -

2 SCREENS

2-1 Screen Organization

- The CNC provides 10 groups of full screen and 4 popup windows.
- Each of full screen groups consists of up to 5 kinds of screens.

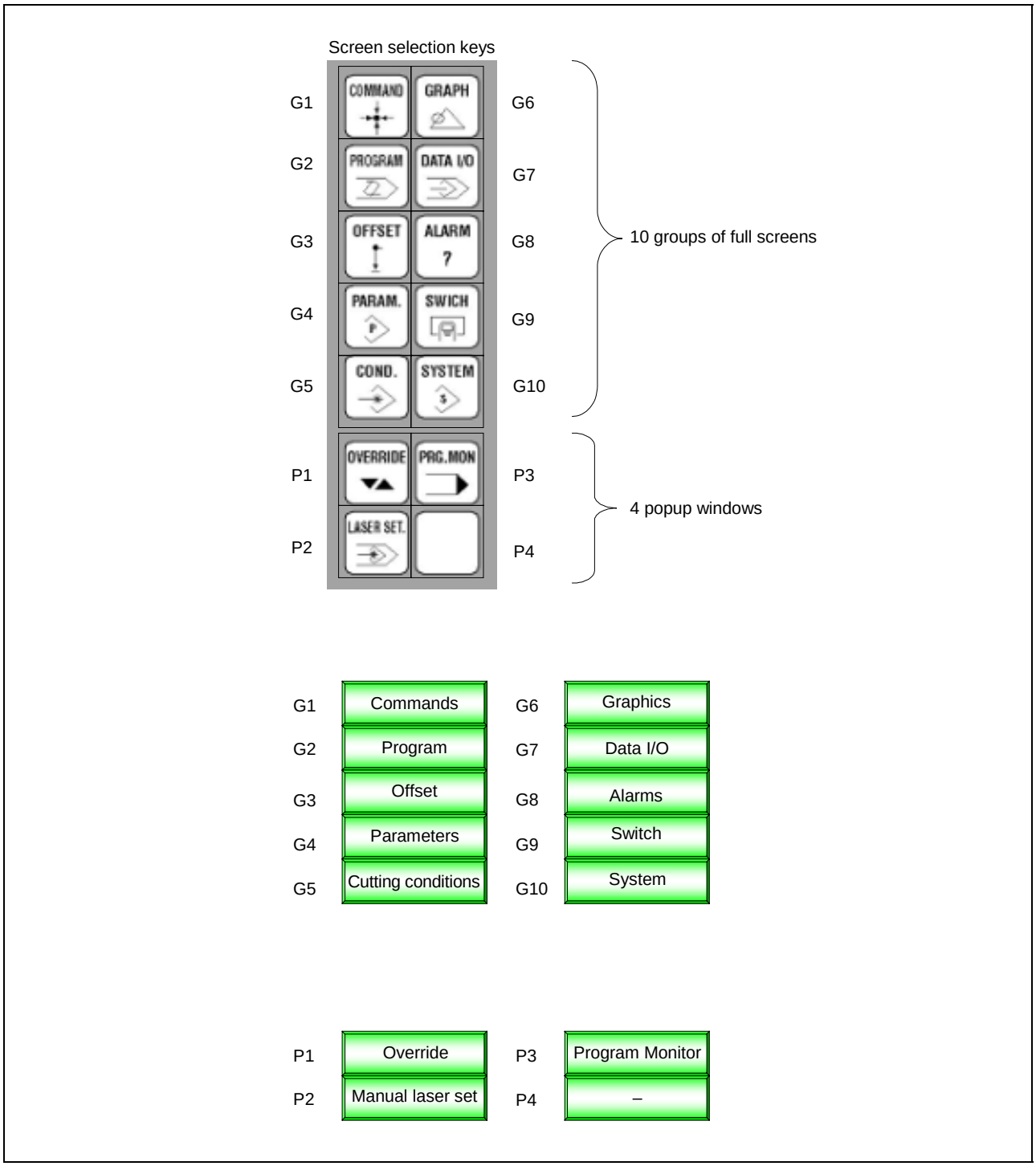


Fig. 2-1 Screen organization

2-2 Screen Extension

2-2-1 Screen extension (HG series)

Repeated pressing of a screen selection key on the keyboard panel calls up the screen in the same group sequentially.

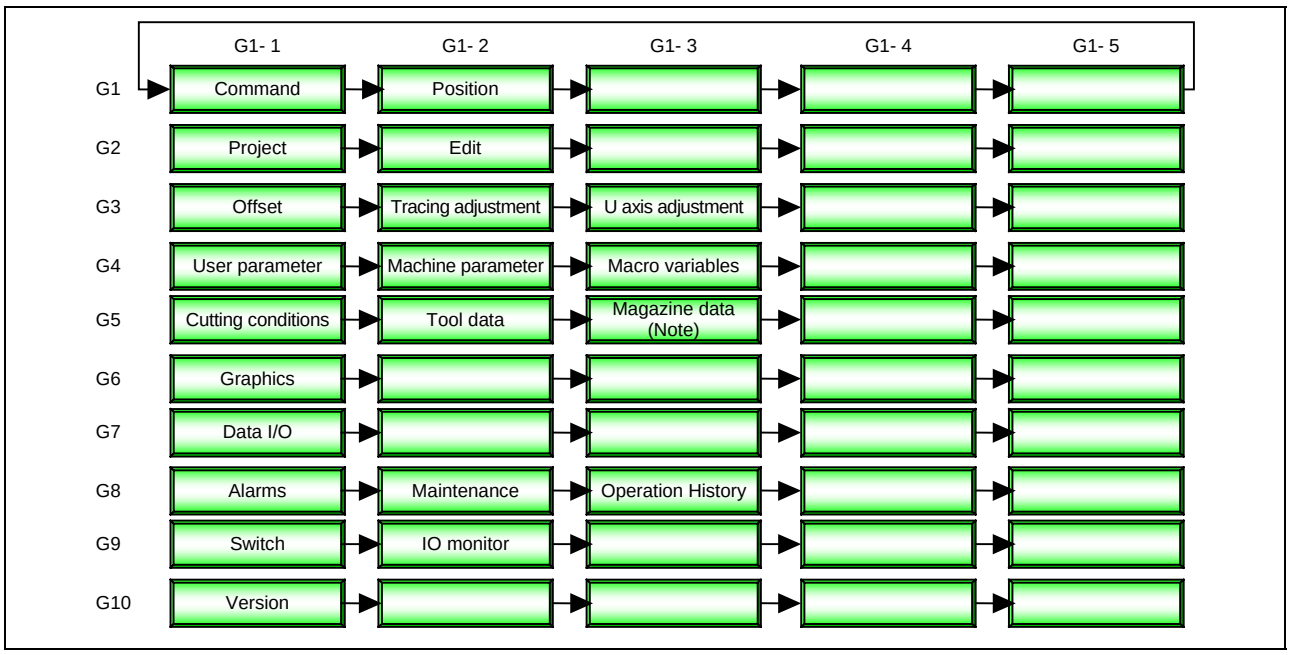


Fig. 2-2 Screen extension (HG series)

Note: Only for the models equipped with the magazine.

For details of the **MAGAZINE DATA** screen, refer to Operating Manual for INTELLIGENT LOOP SYSTEM.

2-2-2 Screen extension (HTX series and STX series)

Repeated pressing of a screen selection key on the keyboard panel calls up the screen in the same group sequentially.

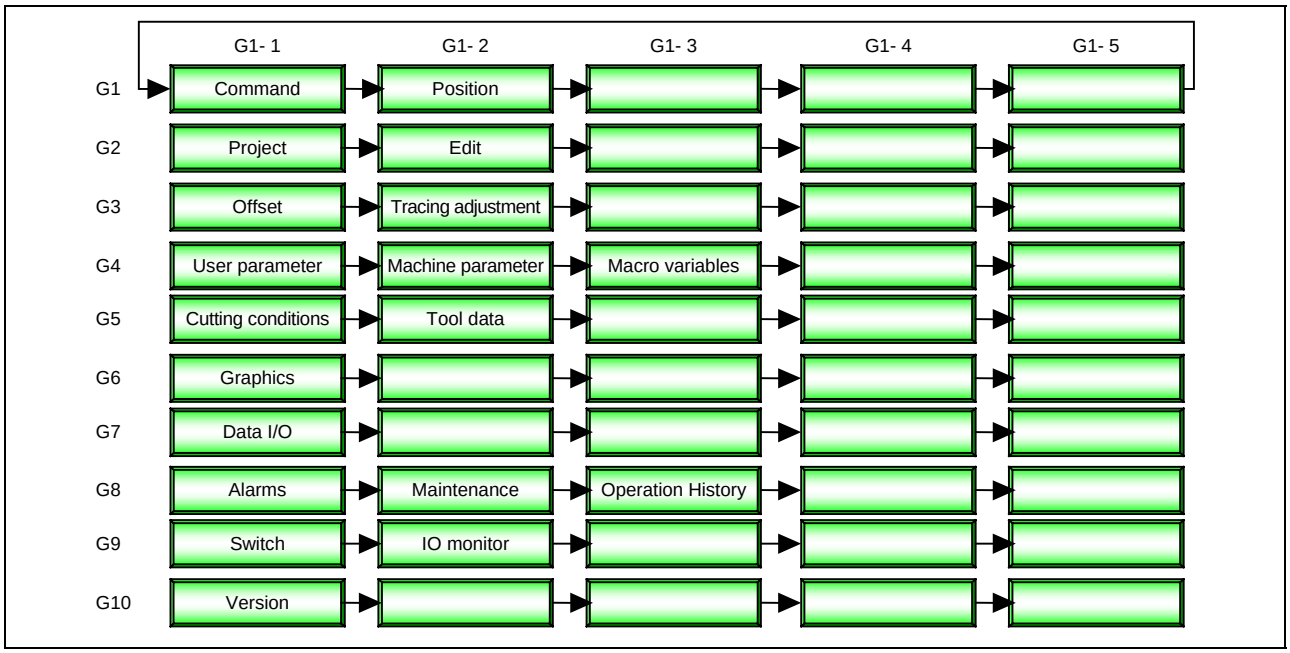


Fig. 2-3 Screen extension (HTX series and STX series)

2-3 Popup Windows

There are 3 kinds of popup windows as shown below. You can display the desired popup window by pressing the corresponding key from any screen.

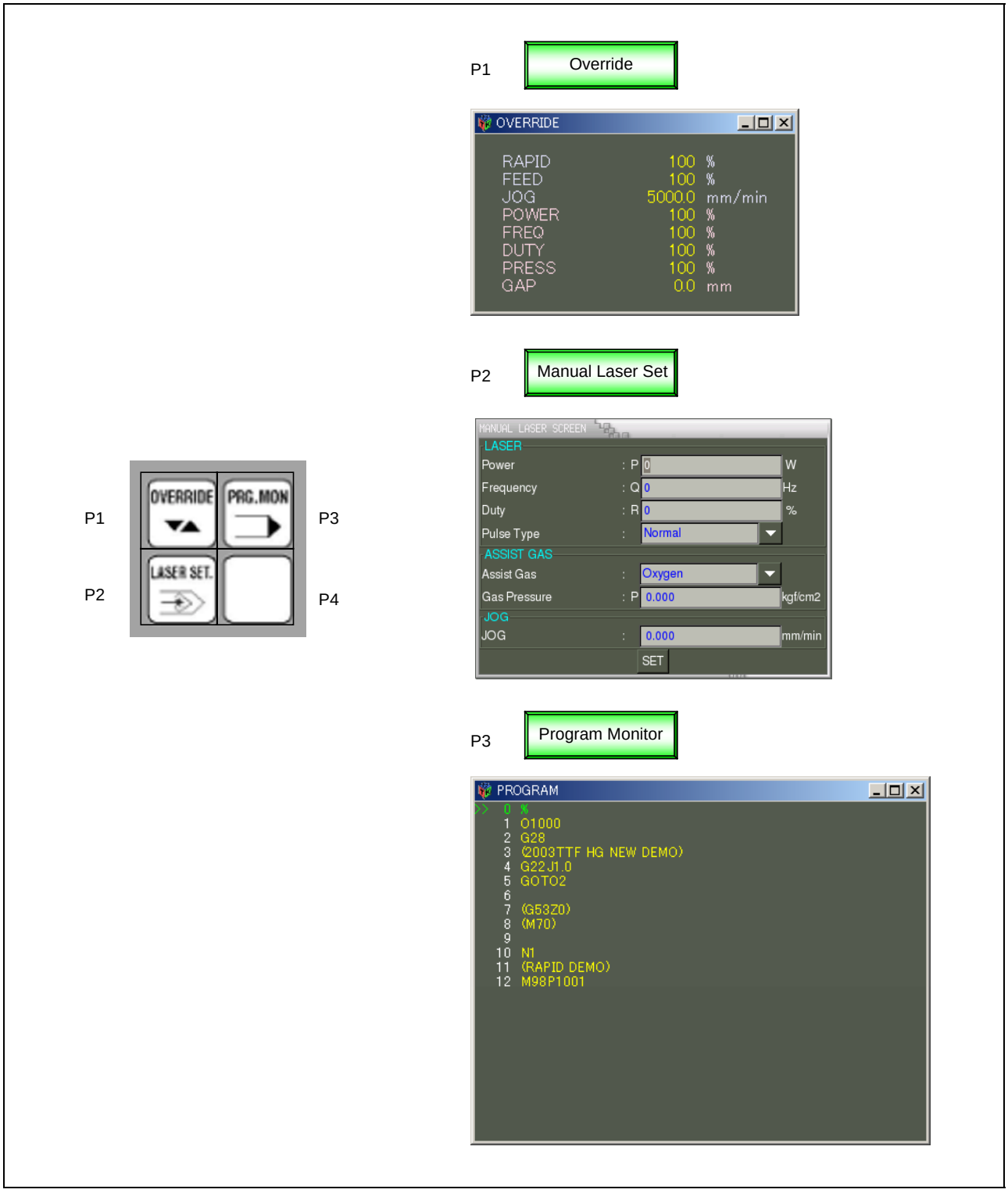
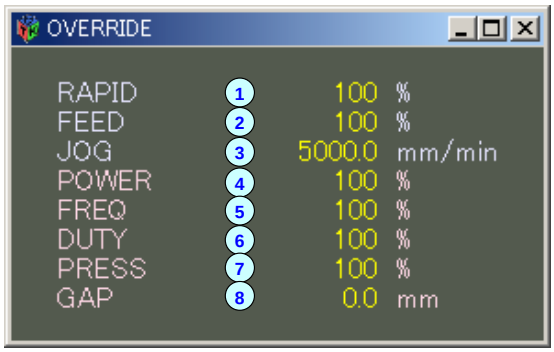


Fig. 2-4 Popup windows

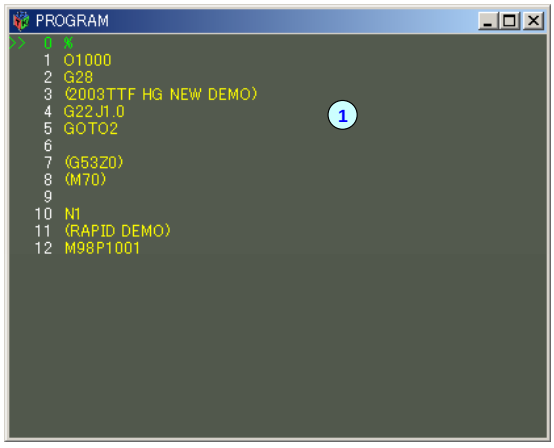
1. OVERRIDE popup window



Display items

No.	Data Name	Display Range	Unit		Description
1	RAPID	0 - 100	%		Rapid feed override
2	FEED	0 - 200	%		Cutting feed override
3	JOG	0 - 99999	mm/min inch/min		JOG feed override
4	POWER	0 - 100	%		Laser power output override
5	FREQ	0 - 100	%		Laser frequency override
6	DUTY	0 - 100	%		Laser duty override
7	PRESS	0 - 100	%		Assist gas pressure override
8	GAP	+9.9	mm		Tracing gap override

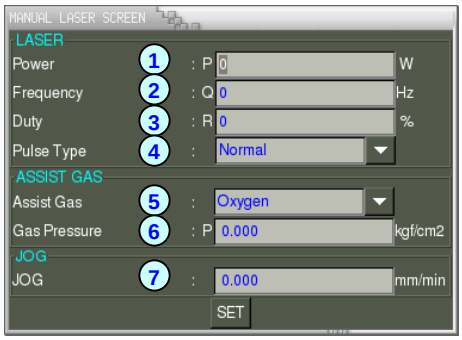
2. PROGRAM popup window



Display items

No.	Data Name	Display Range	Unit		Description
1	Program	-	-		Display of foreground program The arrow indicates the current block (PLC). After the execution of the current block, the arrow moves to the next block.

3. MANUAL LASER SCREEN popup window



Display items

No.	Data Name	Display Range	Unit		Description
1	Power	0 - 9999	W	*1	Manually entered laser output
2	Frequency	0 - 9999	Hz	*1	Manually entered laser frequency
3	Duty	0 - 100	%	*1	Manually entered laser duty
4	Pulse Type	-	-	*1	Manually entered laser pulse type
5	Assist Gas	-	-	*2	Manually entered assist gas type
6	Gas Pressure	0 - 99.9	kgf/cm^2	*2	Manually entered assist gas pressure
7	JOG	0 - 18000.0 0 - 708.66	mm/min inch/min	*2	Manually and directly entered jog feedrate

*1: The range of command and the display range are determined depending on the laser resonator type.

*2: The range of command and the display range are determined depending on the machine model.

2-4 Configuration of Screen Display

A screen consists of multiple windows, and each of the windows consists of multiple pages. You can access the required page of the required window by using the window selection and page selection keys. (The example below shows the screen of the HG series.)

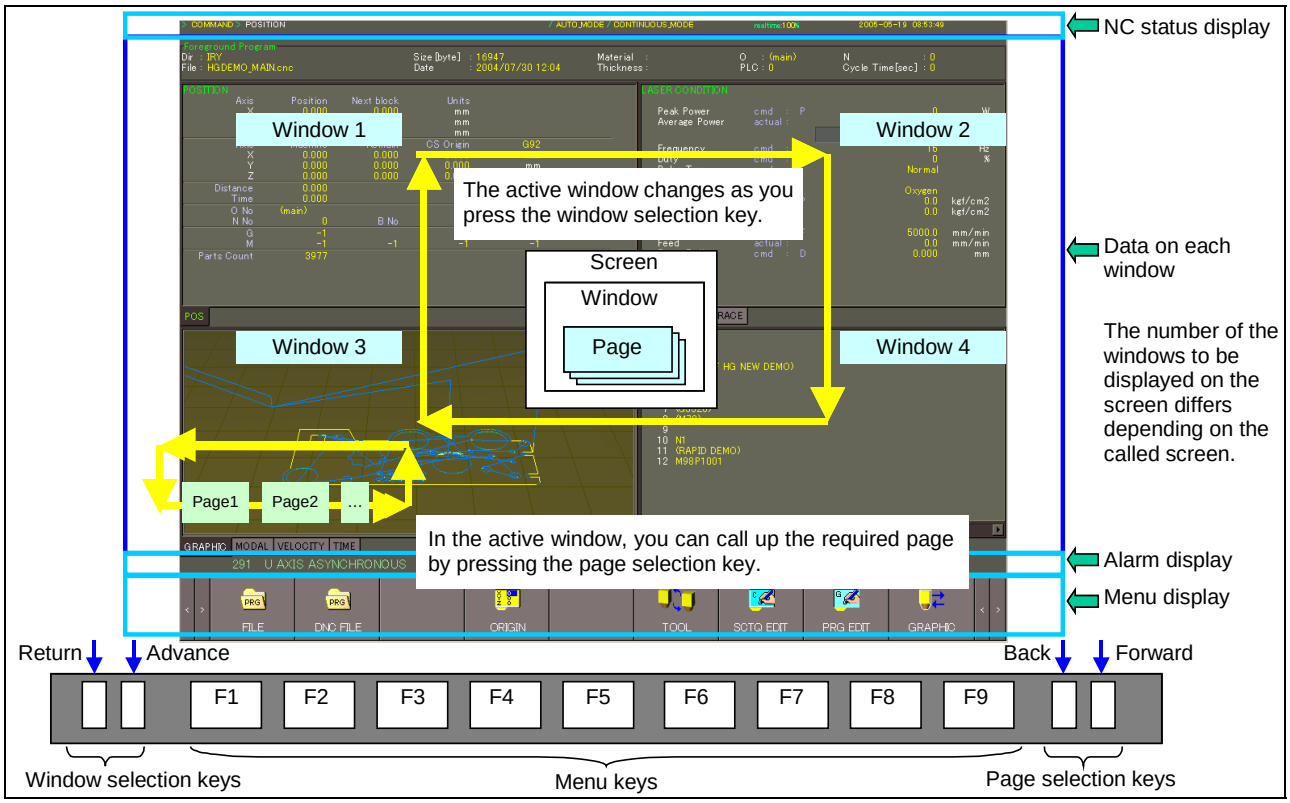


Fig. 2-5 Configuration of screen display

2-5 Control Menu

When you press the [Ctrl Menu] key, the menu display changes to the control menu. The [Ctrl Menu] key is always valid independent of the screen being displayed.

The control menu is used to select the program execution method.
(The example below shows the screen of the HG series.)

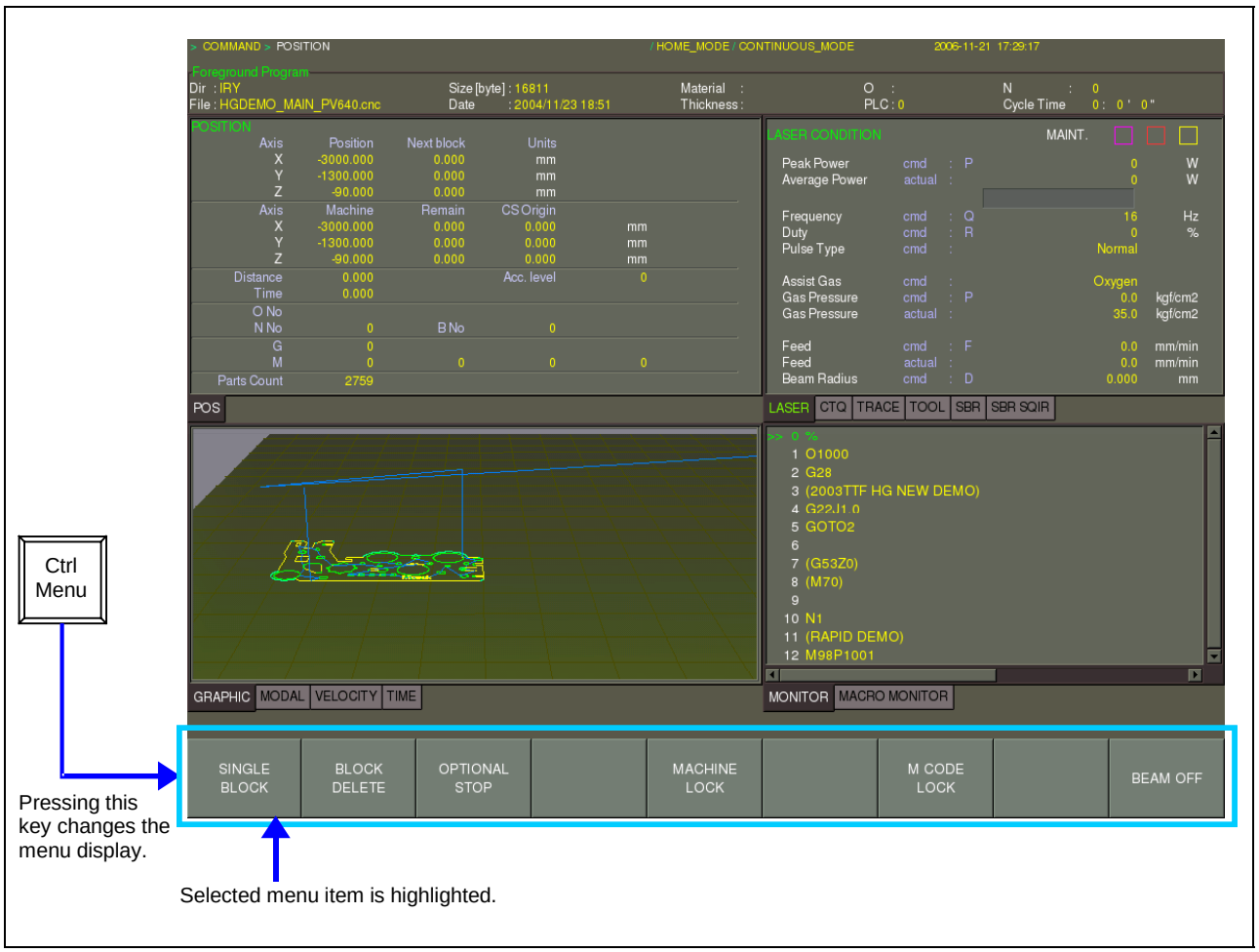


Fig. 2-6 Control menu

2-6 Details of Screens

2-6-1 COMMAND screen

On the **COMMAND** screen, you can select the program to be used for automatic operation.

The screen displays the details of the selected program and the execution status of the program. (The example below shows the screen of the HG series.)

Fig. 2-7 **COMMAND** screen

Screen display

Win-Page	Item	Description
W1	Foreground Program *1	Attribute data of the automatic operation program (foreground program)
W2-P1	POS	Current position and the remaining distance in various coordinate systems (Machine coordinate system, program coordinate system)
W3-P1	LASER	Laser condition
W3-P2	CTQ	Currently selected cutting conditions (available only for Intelligent programs)
W3-P3	TRACE	Tracer condition
W3-P4	TOOL	Status of the currently selected tool
W3-P5	IMS	Status of the intelligent monitoring system (available with v61 and above)
W3-P6	SBR	Nesting status of cutting programs
W3-P7	SBR SQIR	*** Not available yet ***
W4-P1	GRAPHIC	Tool path display
W4-P2	MODAL	Modal information of the program
W4-P3	VELOCITY	Speed of each axis
W4-P4	TIME	Automatic operation time display (program execution time, cutting time, etc.)
W5-P1	MONITOR	Contents of the program currently executed (The program block currently executed is indicated by the arrow.)
W5-P2	MACRO MONITOR	*** Not available yet ***

*1: Foreground program: The program used for automatic operation
(The program that is executed when the cycle start button is pressed.)

Menu description

Menu	Item	Description
1	FILE	The command for selecting the program to be executed It is possible to change the foreground program.
2	DNC FILE	This command is displayed and can be selected only when the DNC function is used.
3	CLEAR SETTING	The command for modifying the **Parts Count** data and the **Auto Operation Time** on the **COMMAND** screen.
4	ORIGIN	The command for setting an arbitrary position taking the current position as the reference. This feature is conveniently used for adjusting the reference position of tracing.
5	INTEL PAR	The command for setting the operation parameters related to the Intelligent Loop System.
6	TOOL	The command for transferring the screen to the **TOOL DATA** screen
7	SCTQ EDIT	The command for editing the cutting conditions of the foreground program (available only for Intelligent programs)
8	PRG EDIT	The command for transferring the screen to the foreground program editing screen.
9	GRAPHIC	The command for transferring the screen to the **GRAPHIC** screen (Tool path is displayed in the enlarged display mode.)

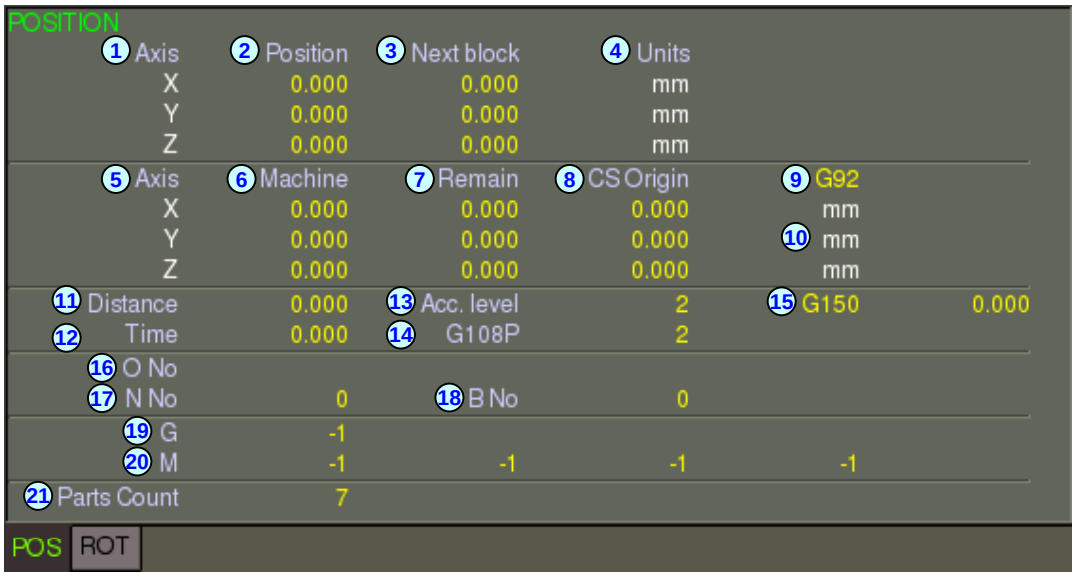
1. Foreground Program window

Display items

No.	Data Name	Display Range	Unit		Description
1	Dir	48 letters	-		Directory in which the foreground program file is stored
2	File	48 letters *1	-		Name of the foreground program file
3	Size	0 - 999999	-		Size of the foreground program file
4	Date	-	AD		Date of foreground program update
5	Material	-	-		Worksheet material name of the foreground program (available only when Intelligent program is selected)
6	Thickness	-	mm		Worksheet thickness of the foreground program (available only when Intelligent program is selected)
7	O	-	-		O number of the currently executed program
8	PLC	-	-		The line number of the currently executed program line
9	N	-	-		Sequence number of the program block currently executed
10	Cycle Time	0 - 999:59'59"	Hour-Min'Sec"		The time the program has been executed

*1: Display range of a sub-program file name is up to 8 letters.

2. POS page



Display items

No.	Data Name	Display Range	Unit		Description
1	Axis	-	-		Axis name
2	Position	±99999.999 ±9999.9999	mm inch		Current tool position in the currently selected coordinate system
3	Next block	±99999.999 ±9999.9999	mm inch		The position where the tool should move next
4	Units	mm/inch	mm inch		Unit system
5	Axis	-	-		Axis name
6	Machine	±99999.999 ±9999.9999	mm inch		Current tool position in the machine coordinate system
7	Remain	±99999.999 ±9999.9999	mm inch		Remaining distance the tool should move in the currently executed block in the machine coordinate system
8	CS Origin	±99999.999 ±9999.9999	mm inch		Machine position of the origin of the currently selected coordinate system
9	Coordinate system	-	-		Currently selected coordinate system G92, G54 - G59
10	Unit	mm/inch	mm inch		Unit system
11	Distance	±99999.999 ±9999.9999	mm inch		Remaining distance to the end point of the tool path in the currently executed block
12	Time	+9999.999	sec		Remaining time required to complete the currently executed block
13	Acc. level	0 - 2	-		Acceleration level of the currently executed operation
14	G108P	0 - 2	-		Currently executed machining mode
15	G150	9999.9999	mm inch		Z-axis modal distance of the currently executed G150 command
16	O No	1 - 99999999	-		Program number of the currently executed program
17	N No	1 - 9999	-		Sequence number of the currently executed sequence

No.	Data Name	Display Range	Unit		Description
18	B No	1 - 9999	-		Block number counted from the current sequence number
19	G	0 - 999	-		G codes specified in the next block
20	M	0 - 999	-		M codes specified in the next block
21	Parts Count	-	-		Total number of times M02 and M30 have been executed

3. LASER page

LASER CONDITION
MAINT.
Peak Power 1 cmd : P 0 W
Average Power 2 actual : 0 W
Frequency 3 cmd : Q 16 Hz
Duty 4 cmd : R 0 %
Pulse Type 5 cmd : Normal
Assist Gas 6 cmd : Oxygen
Gas Pressure 7 cmd : P 0.0 kgf/cm2
Gas Pressure 8 actual : 35.0 kgf/cm2
Feed 9 cmd : F 0.0 mm/min
Feed 10 actual : 0.0 mm/min
Beam Radius 11 cmd : D 0.000 mm
LASER
CTQ
TRACE
TOOL
SBR
SBR SQIR

Display items

No.	Data Name	Display Range	Unit		Description
1	Peak Power	0 - 9999	W	*1	Specified laser output power
2	Average Power	0 - 9999	W	*1	Average laser output power
3	Frequency	0 - 9999	Hz	*1	Specified laser pulse oscillation frequency
4	Duty	mm/inch	%	*1	Specified laser pulse duty
5	Pulse Type	-	-	*1	Specified laser pulse type
6	Assist Gas	0 - 99.9	kgf/cm^2	*2	Specified assist gas type
7	Gas Pressure	0 - 99.9	kgf/cm^2	*2	Specified assist gas pressure
8	Gas Pressure	0 - 99.9	-	*2	Actual assist gas pressure (available only for HG/HTX series)
9	Feed	0 - 999999	mm/min inch/min	*2	Specified feed rate (speed)
10	Feed	0 - 999999	mm/min inch/min	*2	Actual feed rate (speed)
11	Beam Radius	0 - 9.999	mm inch	*2	Specified beam radius offset value

*1: The range of command and the display range are determined depending on the laser resonator type.

*2: The range of command and the display range are determined depending on the machine model.

4. CTQ page (available only when Intelligent program is selected)

(The example below shows the screen of the HG series.)

Display items

No.	Data Name	Display Range	Unit		Description
1	Machine Type	-	-		Type of laser cutting machine
2	Laser Power	-	-		Maximum power of laser resonator
3	Material	-	-		Currently selected material
4	Thickness	-	mm		Currently selected thickness
5	Gas Type	-	-		Type of assist gas
6	Lens	-	inch		Size of the currently selected lens
7	Nozzle Diameter	-	mm		Size of the currently selected noise
8	Lens P	-	inch		Size of the lens selected for piercing
9	Nozzle Diameter P	-	mm		Size of the nozzle selected for piercing
10	Nozzle Focus P	-	mm		Focus offset of the lens selected for piercing
11	Lens C	-	inch		Size of the lens selected for cutting
12	Nozzle Diameter C	-	mm		Size of the nozzle selected for cutting
13	Nozzle Focus C	-	mm		Focus offset of the lens selected for cutting
14	Company	-	-		Name of company
15	Country	-	-		Name of country
16	Date	-	-		Date of program creation
17	Author	-	-		Name of programmer
18	Note	-	-		Comment for the file

5. TRACE page

Display items

No.	Data Name	Display Range	Unit		Description
1	Filtered Voltage	–99.99 - 99.99	V		Voltage currently output from the tracer
2	Tracer Type	-	-		Type of the currently selected tracer
3	Base Gap	±99999999.999	mm		Datum tracer gap value
4	Gap Offset Command	–9.9 - 9.9	mm		Gap offset value specified by G87
5	Gap Override Command	–9.9 - 9.9	mm		Gap override value set by the override
6	Command Gap	–9.9 - 9.9	mm		Final target gap value
7	Actual Gap	–9.9 - 9.9	mm		Actual gap value
8	Tracer in active	-	-		ON during tracing operation
9	Tracer in range	-	-		ON when the tracer enters the sensor range
10	Tracer in position	-	-		ON when the tracer enters the in-position range
11	Tracer far	-	-		ON when the tracer is too far
12	Tracer near	-	-		ON when the tracer is too close

6. TOOL page

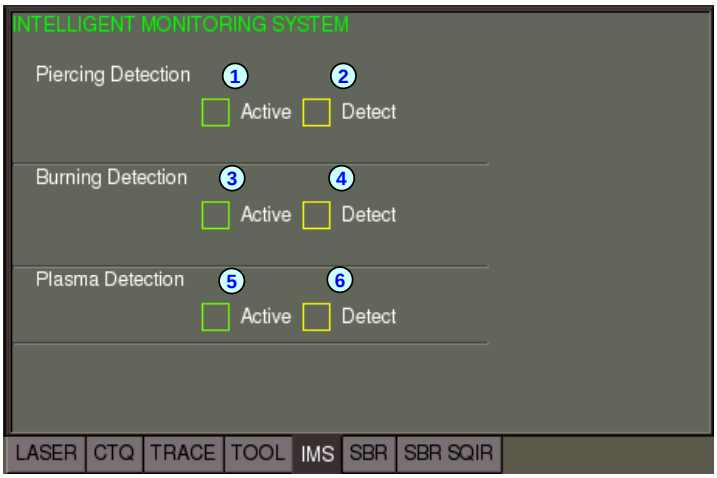
Display items

No.	Data Name	Display Range	Unit		Description
1	Current Torch No	-	-		Currently selected torch No.
2	Current Nozzle No	-	-		Currently selected nozzle No.
3	Current Head Status	0/1/2	-		Current status of the head 0: Without nozzle/torch 1: With torch only 2: With nozzle/torch
4	Auto Focus Exe Torch No	-	-		Torch No. for which automatic focus was executed
5	Auto Focus Exe Offset	–9.999 - 9.999	mm		Offset value used in execution of automatic focus
6	Auto Focus Completed	0/1	-		Confirmation for completion of auto focus execution 0: Not completed 1: Completed
7	Tracer Calib Completed	0/1	-		Confirmation for completion of tracer calibration 0: Not completed 1: Completed

7. IMS page

The example below shows the screen when the IMS function is valid. (For details, refer to Operating Manual for INTELLIGENT LOOP SYSTEM.)

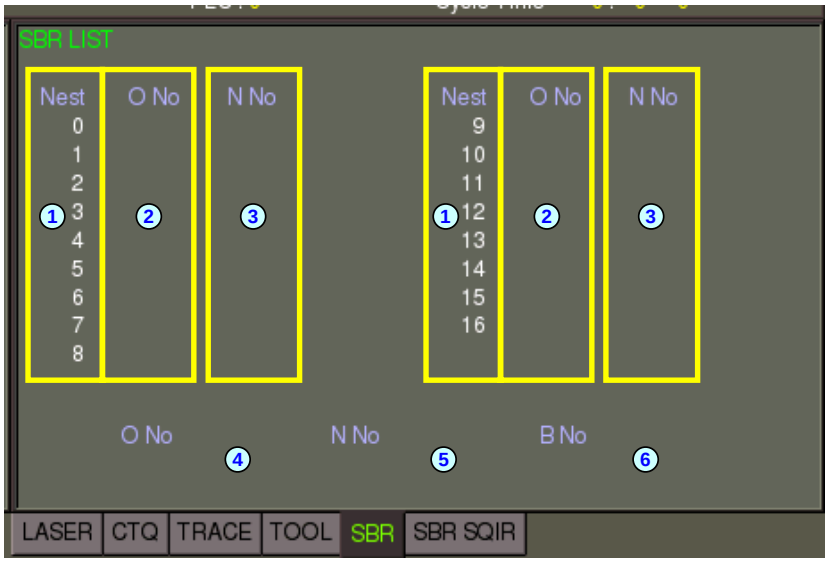
The screen is available with v61 and above.



Display items

No.	Data Name	Display Range	Unit		Description
1	Piercing Detection Active	–	–		Lights when the piercing detection function is active.
2	Piercing Detection Detect	–	–		Lights when piercing is detected.
3	Burning Detection Active	–	–		Lights when the burning detection function is active.
4	Burning Detection Detect	–	–		Lights when burning is detected.
5	Plasma Detection Active	–	–		Lights when the plasma detection function is active.
6	Plasma Detection Detect	–	–		Lights when plasma is detected.

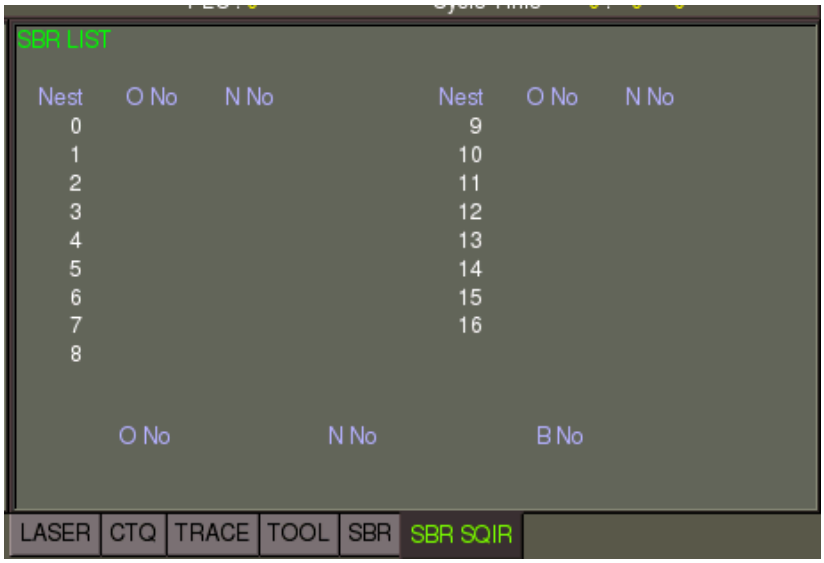
8. SBR page



Display items

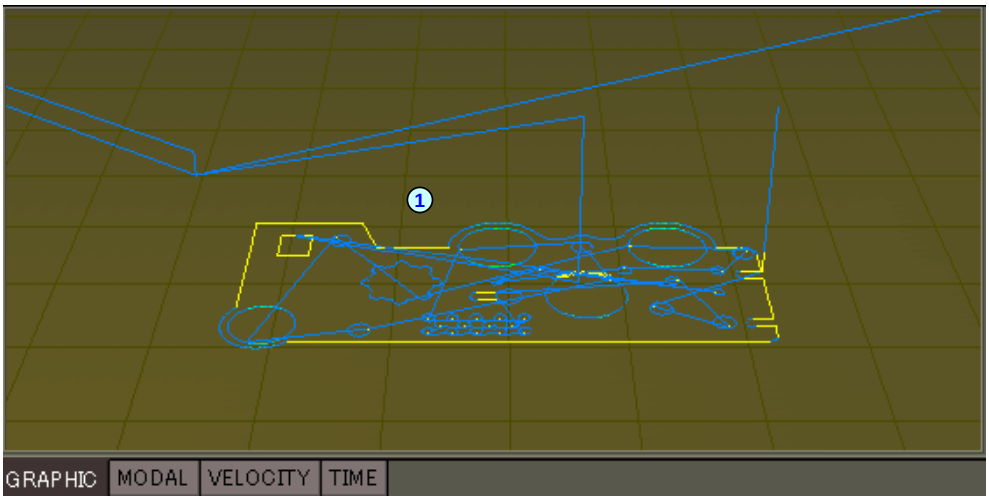
No.	Data Name	Display Range	Unit		Description
1	Nest	-	-		Hierarchy display of subprogram call
2	O No	-	-		O numbers of subprograms called in each nesting level
3	N No	-	-		Sequence number where subprogram call is executed in each nesting level
4	O No	-	-		O number used when the previous automatic operation ended
5	N No	-	-		Sequence number valid when the previous automatic operation ended
6	B No	-	-		Block number valid when the previous automatic operation ended

9. SBR SQIR page



*** Not available yet ***

10. GRAPHIC page



Display items

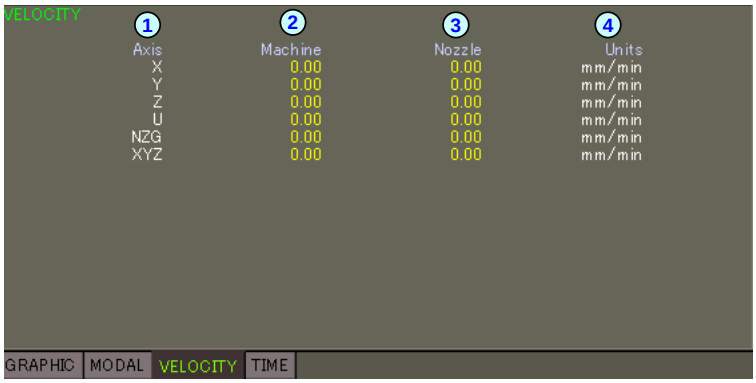
No.	Data Name	Display Range	Unit		Description
1	GRAPHIC	-	-		Tool path of the foreground program Yellow: Linear interpolation Green: Circular interpolation Blue : Rapid traverse

11. MODAL page

Display items

No.	Data Name	Display Range	Unit		Description
1	G code	0 - 999	-		Modal G codes G code number of the G code currently selected for each G code group

12. VELOCITY page



Display items

No.	Data Name	Display Range	Unit		Description
1	Axis	-	-		Axis name
2	Machine	0 - 999999.99 0 - 99999.999	mm/min inch/min		Current speed of each axis of the machine
3	Nozzle	0 - 999999.99 0 - 99999.999	mm/min inch/min		Current speed of each axis of the tool
4	Units	mm/min inch/min	-		Unit system

13. TIME page

CYCLE TIME
1 Auto Operation Time 0 : 0 ' 0 "
2 Auto Cutting Time 0 : 0 ' 0 "
3 Macro Interrupt Time 0 : 0 ' 0 "
TOTAL TIME
4 CNC Power On Time 923 : 45 ' 58 "
5 Laser Power On Time 913 : 38 ' 38 "
6 Auto Operation Time 12 : 58 ' 37 "
7 Auto Cutting Time 0 : 58 ' 21 "
8 Cutting Time 0 : 6 ' 36 "
9 Macro Interrupt Time 0 : 0 ' 0 "
GRAPHIC
MODAL
VELOCITY
TIME

Display items

No.	Data Name	Display Range	Unit		Description
1	Auto Operation Time	0 - 999:59'59"	H M S		Automatic operation time of the foreground program
2	Auto Cutting Time	0 - 999:59'59"	H M S		Cutting time of the foreground program
3	Macro Interrupt Time	-	-		*** Not available yet ***
4	CNC Power On Time	0:00'00" - 99999:59'59"	H M S		Accumulated CNC power ON time
5	Laser Power On Time	0:00'00" - 99999:59'59"	H M S		Accumulated laser ON time
6	Auto Operation Time	0 - 99999:59'59"	H M S		Accumulated time of automatic operation
7	Auto Cutting Time	0 - 99999:59'59"	H M S		Accumulated cutting time during automatic operation
8	Cutting Time	0 - 99999:59'59"	H M S		Accumulated time of cutting
9	Macro Interrupt Time	-	-		*** Not available yet ***

14. MONITOR page

Display items

No.	Data Name	Display Range	Unit		Description
1	PLC	-	-		Line numbers of the foreground program The currently executed program line is highlighted in green.
2	Foreground program	-	-		Foreground program The currently executed block line is highlighted in green. 14 lines of program are displayed.

15. MACRO MONITOR page

*** Not available yet ***

2-6-2 POSITION screen

On the **POSITION** screen, you can confirm the details of the selected program and the execution status of the program.

(The example below shows the screen of the HG series.)

Fig. 2-8 **POSITION** screen

Screen display

Win-Page	Item	Description
W1-P1	POSITION	Current position and remaining distance of each axis (In the machine coordinate system and program coordinate system)

*1: The same menu items displayed on the **COMMAND** screen are displayed here. For details of the menu items, refer to the explanation of the **COMMAND** screen.

2-6-3 PROJECT screen

On the **PROJECT** screen, you can edit the foreground program and operate the program file as below:

1. Selection/modification of the foreground program
2. Confirmation of the existing program data
3. Copying, searching, renaming and deleting of program files

1. List display of project

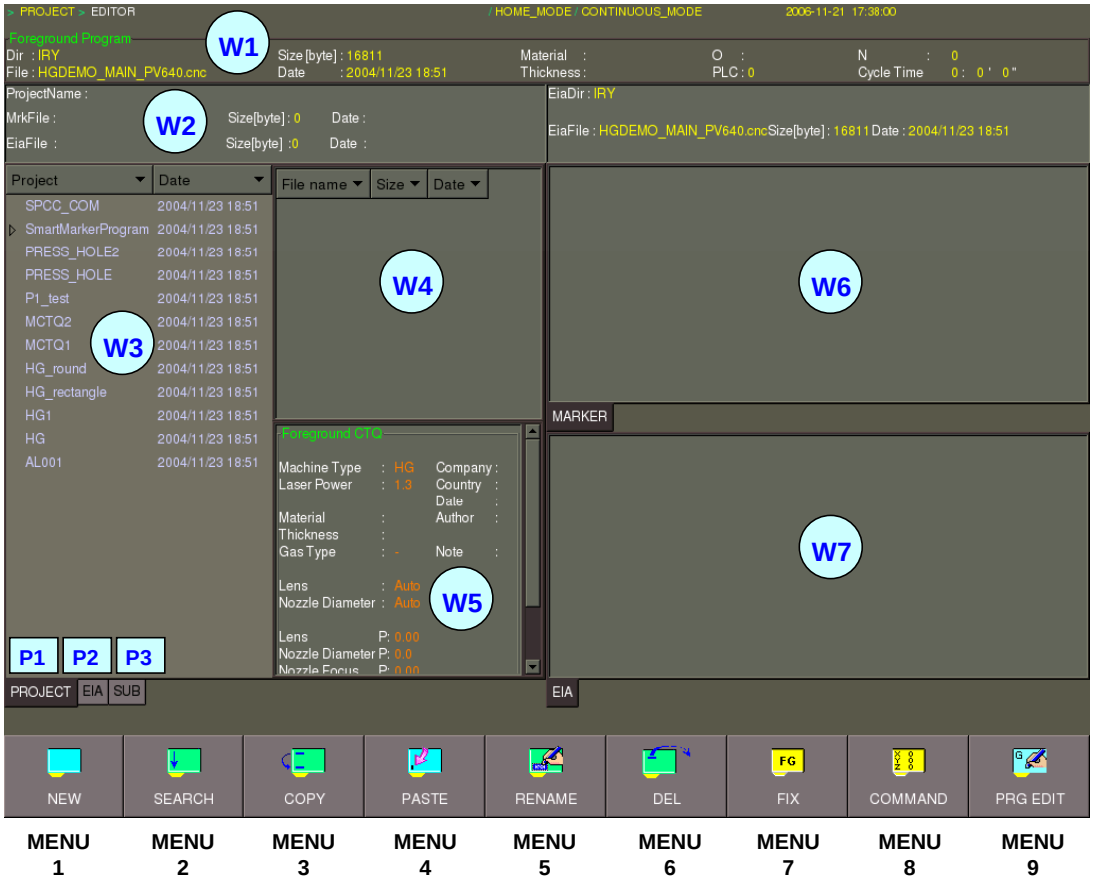


Fig. 2-9 **PROJECT** screen

Screen display

Win-Page	Item	Description
W1	Foreground Program *1	Attribute data of the program for automatic operation (foreground program)
W2	Selection Program	Attribute data of the selected program
W3-P1	PROJECT	Intelligent programs
W3-P2	EIA	EIA programs
W3-P3	SUB	Common EIA sub programs
W4	Intelligent program files	Files that configure Intelligent program
W5	Foreground CTQ	Cutting condition data used in the selected Intelligent program
W6	MARKER	Marker program in the selected Intelligent program
W7	EIA	EIA program created after conversion of marker program

*1: Refer to the **Foreground Program** window of the **COMMAND** screen.

Menu description

Menu	Item	Description
1	NEW	The command for creating a new program
2	SEARCH	The command for searching for a program
3	COPY	The command for copying a program
4	PASTE	The command for pasting a program
5	RENAME	The command for renaming a program file name
6	DEL	The command for deleting a program
7	FIX	The command for switching the selected program as the foreground program
8	COMMAND	The command for transferring the screen to the **COMMAND** screen
9	PRG EDIT	The command for transferring the screen to the program editing screen of the selected program

2. Display of the selected program file information

Display items

No.	Data Name	Display Range	Unit		Description
1	Project Name	48 letters	-		Project name of selected Intelligent program
2	MrkFile	48 letters	-		Marker program file name of the selected Intelligent program
3	Size	999999	byte		The marker program size of the selected Intelligent program
4	Date	-	AD		Date of the marker program of the selected Intelligent program
5	EiaFile	48 letters	-		File name of the EIA program of the selected Intelligent program
6	Size	999999	byte		EIA program size of the selected Intelligent program
7	Date	-	-		The EIA program date of the selected Intelligent program
8	EiaDir	48 letters	-		The directory name of the selected EIA program
9	EiaFile	48 letters	-		The file name of the selected EIA program
10	Size	999999	byte		The size of the selected EIA program
11	Date	-	AD		The date of the selected EIA program

3. List display of EIA program

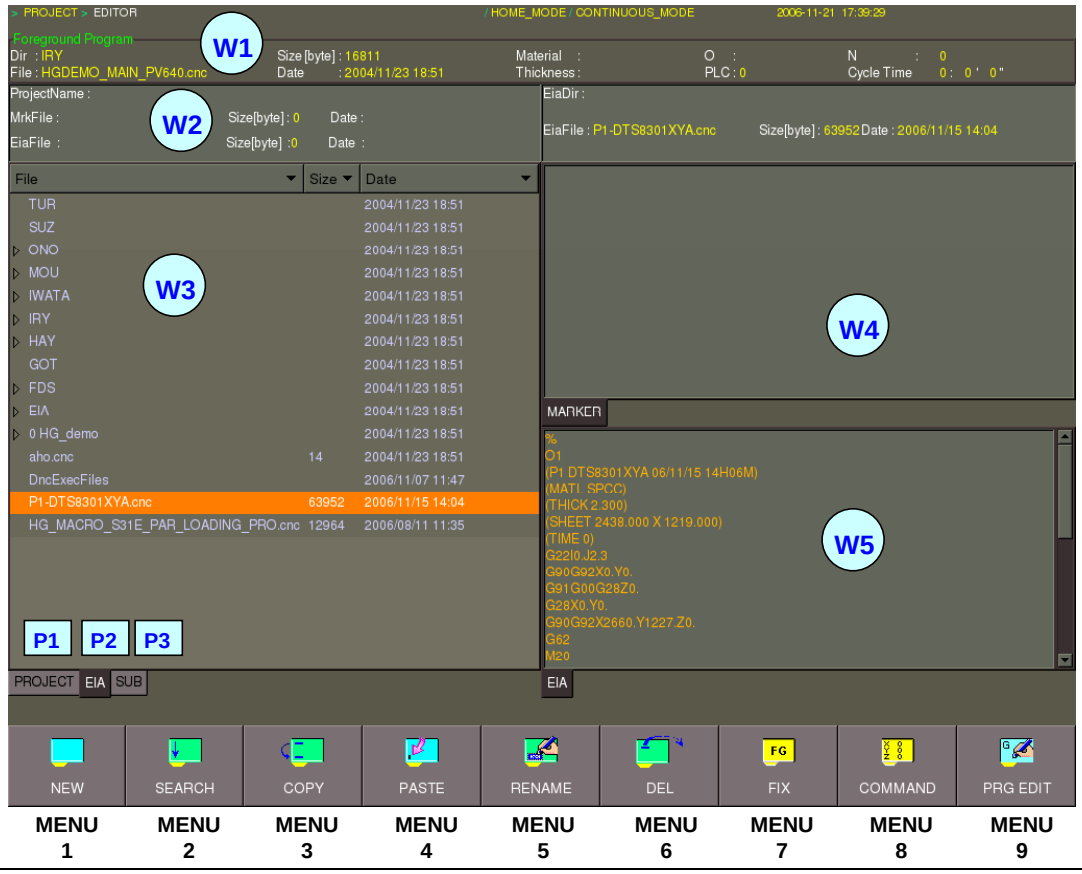


Fig. 2-10 List display of EIA program

Screen display

Win-Page	Item	Description
W1	Foreground Program *1	Attribute data of the program for automatic operation (foreground program)
W2	Selection Program	Attribute data of the selected program
W3-P1	PROJECT	Intelligent programs
W3-P2	EIA	EIA programs
W3-P3	SUB	Common EIA sub programs
W4	MARKER	*** Not used when EIA program is displayed ***
W5	EIA	Displays contents of the currently selected EIA program.

*1: Refer to the **Foreground Program** window of the **COMMAND** screen.

Menu description

Menu	Item	Description
1	NEW	The command for creating a new program
2	SEARCH	The command for searching for a program
3	COPY	The command for copying a program
4	PASTE	The command for pasting a program
5	RENAME	The command for renaming a program file name
6	DEL	The command for deleting a program
7	FIX	The command for switching the selected program as the foreground program
8	COMMAND	The command for transferring the screen to the **COMMAND** screen
9	PRG EDIT	The command for transferring the screen to the program editing screen of the selected program

2-6-4 EDITOR screen

On the **EDITOR** screen, you can create and edit a program.

1. Creating a new program
2. Editing an existing program

1. Editing an Intelligent program

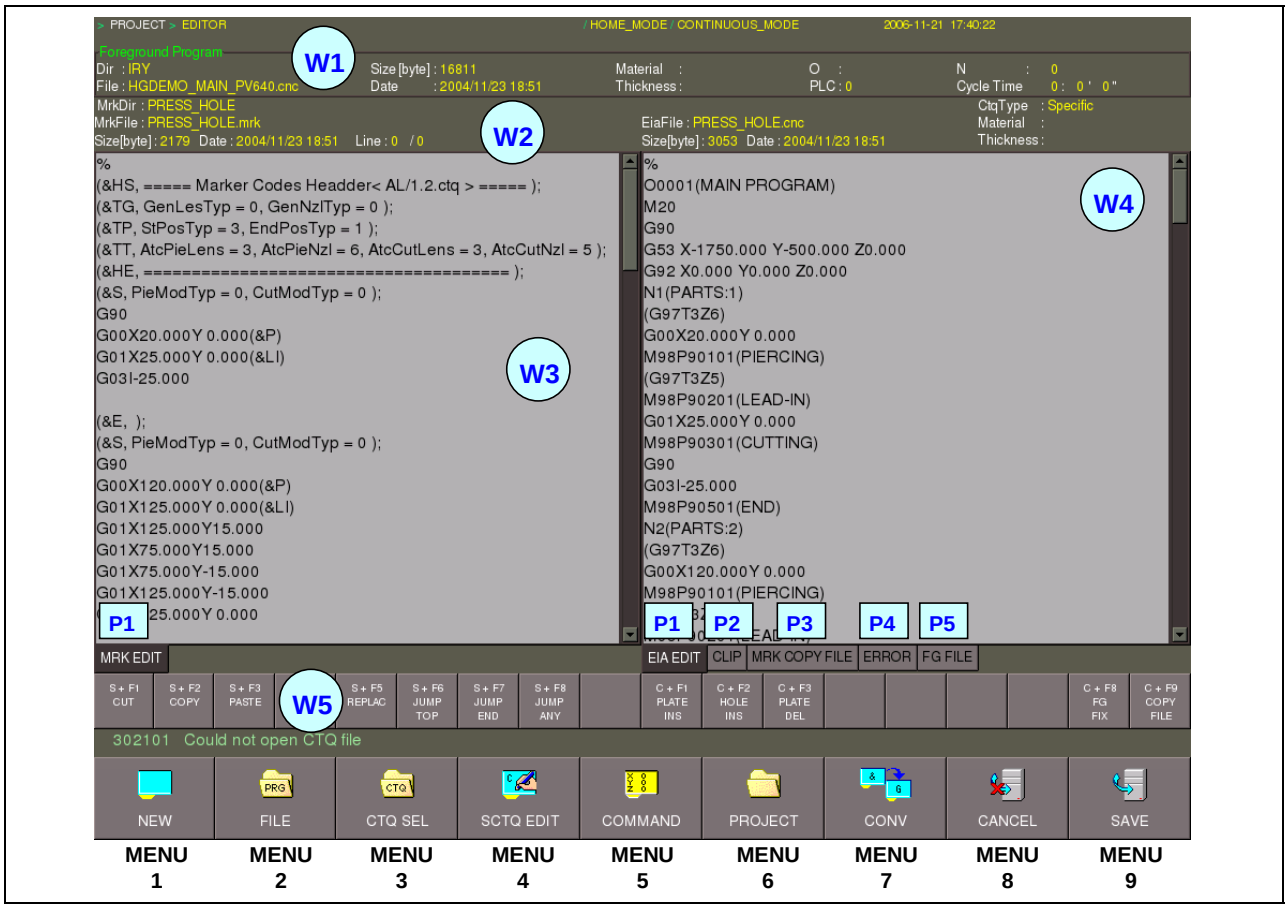


Fig. 2-11 Editing an Intelligent program

Screen display

Win-Page	Item	Description
W1	Foreground Program *1	Attribute data of the program for automatic operation (foreground program)
W2	Selection Program	Attribute data of the selected program
W3-P1	MRK EDIT	The area for editing a marker program
W4-P1	EIA EDIT	The area for editing an EIA program, converted from a marker program
W4-P2	CLIP	Clip board (Temporary copy area of the program to be edited)
W4-P3	MRK COPY FILE	Display of a program other than the program currently edited (Allows copying of data of other programs.)
W4-P4	ERROR	Display of syntax error of the program currently edited (Updates the program when **[SAVE]** menu key is pressed.)
W4-P5	FG FILE	Display of the contents of the program used for automatic operation (Shows the contents of a sub program.)
W5	SUB MENU	Program editing function menu Left menu: Executed by [Shift] + **[Menu]** keys Right menu: Executed by [Ctrl] + **[Menu]** keys

*1: Refer to the **Foreground Program** window of the **COMMAND** screen.

Menu description

Menu	Item	Description
1	NEW	The command for creating a new Intelligent program
2	FILE	The command for selecting an Intelligent program
3	CTQ SEL	The command for selecting cutting conditions to be used for the currently selected project
4	SCTQ EDIT	The command for changing the cutting condition data of the cutting conditions, used for the currently selected project, as the project-specific cutting conditions.
5	COMMAND	The command for transferring the screen to the **COMMAND** screen
6	PROJECT	The command to move to the **PROJECT** screen
7	CONV	The command for converting the created marker program to an EIA program
8	CANCEL	The command for canceling the edit that has been made
9	SAVE	The command for saving the program that has been edited

2. Editing an EIA program

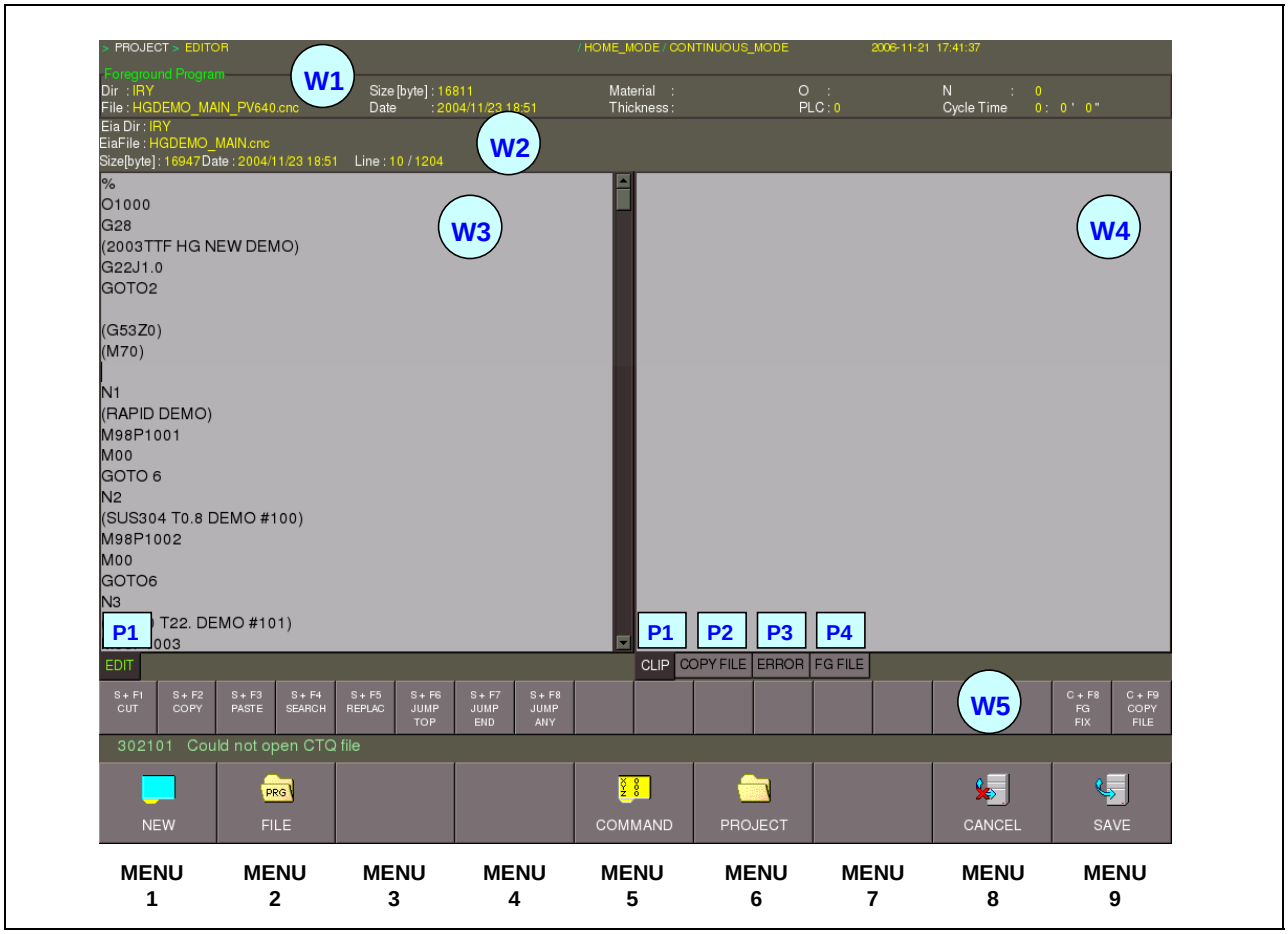


Fig. 2-12 Editing an EIA program

Screen display

Win-Page	Item	Description
W1	Foreground Program *1	Attribute data of the program for automatic operation (foreground program)
W2	Editing Program	Attribute data of currently editing program
W3-P1	EDIT	Program edit area (Program data is displayed.)
W4-P1	CLIP	Clip board (Temporary copy area of the program to be edited)
W4-P2	COPY FILE	Display of a program other than the program currently edited (Allows copying of data of other programs.)
W4-P3	ERROR	Display of syntax error of the program currently edited (Updates the program when **[SAVE]** menu key is pressed.)
W4-P4	FG FILE	Display of the contents of the program used for automatic operation (Shows the contents of a sub program.)
W5	SUB MENU	Program editing function menu Left menu: Selected by [Shift] + **[Menu]** keys Right menu: Selected by [Ctrl] + **[Menu]** keys

*1: Refer to the **Foreground Program** window of the **COMMAND** screen.

Menu description

Menu	Item	Description
1	NEW	The command for making a new program
2	FILE	The command for selecting the program to be edited
3		
4		
5	COMMAND	The command for transferring the screen to the **COMMAND** screen
6	PROJECT	The command to move to the **PROJECT** screen
7		
8	CANCEL	The command for canceling the edit that has been made
9	SAVE	The command for saving the program that has been edited

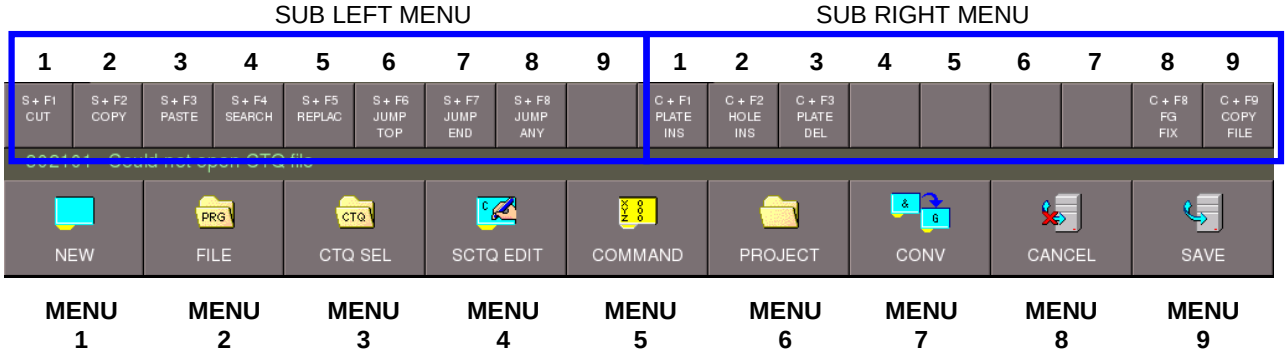
3. Display of the Editing Program file information

Display items

No.	Data Name	Display Range	Unit		Description
1	Eia Dir	48 letters	-		Directory name of the EIA program being edited
2	EiaFile	48 letters	-		EIA program currently edited
3	Size	0 - 999999	byte		Size of EIA program currently edited
4	Date	-	AD		Date of EIA program currently edited
5	Line	0 - 99999	-		The cursor located line of the program currently edited Current position / Total number of lines

4. Sub menu keys used only for the editor

A. Editing an Intelligent program



SUB LEFT MENU

Menu	Item	Description
1	CUT	The command for cutting the program data
2	COPY	The command for copying the program data
3	PASTE	The command for pasting the program data
4	SEARCH	The command for searching the character string of the program data (Search is possible only for a single line.)
5	REPLAC	The command for replacing the character string of the program data (Replace is possible only for a single line.)
6	JUMP TOP	The command for jump to the first line of the program
7	JUMP END	The command for jump to the last line of the program
8	JUMP ANY	The command for jump to the specified line of the program
9		

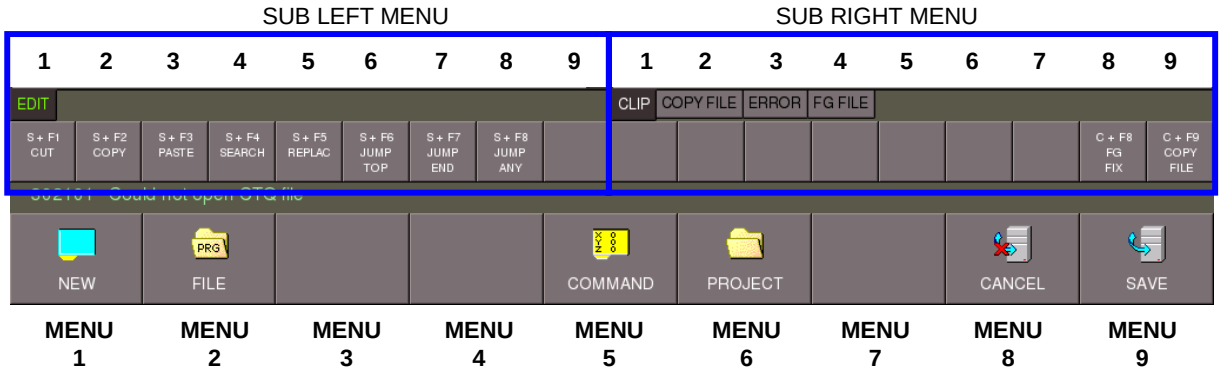
- Select the command by [Shift] + **[Menu]** keys.

SUB RIGHT MENU

Menu	Item	Description
1	PLATE INS	The command for inserting a plate
2	HOLE INS	The command for inserting a hole shape
3	PLATE DEL	The command for deleting a plate
4		
5		
6		
7		
8	FG FIX	The command for selecting the currently edited project to the foreground
9	COPY FILE	The command to display a program other than the program currently edited

- Select the command by [Ctrl] + **[Menu]** keys.

B. Editing an EIA program



SUB LEFT MENU

Menu	Item	Description
1	CUT	The command for cutting the program data
2	COPY	The command for copying the program data
3	PASTE	The command for pasting the program data
4	SEARCH	The command for searching the character string of the program data (Search is possible only for a single line.)
5	REPLAC	The command for replacing the character string of the program data (Replace is possible only for a single line.)
6	JUMP TOP	The command for jump to the first line of the program
7	JUMP END	The command for jump to the last line of the program
8	JUMP ANY	The command for jump to the specified line of the program
9		

- Select the command by [Shift] + **[Menu]** keys.

SUB RIGHT MENU

Menu	Item	Description
1		
2		
3		
4		
5		
6		
7		
8	FG FIX	The command for selecting the currently edited project to the foreground
9	COPY FILE	The command to display a program other than the program currently edited

- Select the command by [Ctrl] + **[Menu]** keys.

2-6-5 OFFSET screen

On the **OFFSET** screen, you can set and check the offset data as below:

1. Offset value in a work coordinate system
2. Beam radius offset data

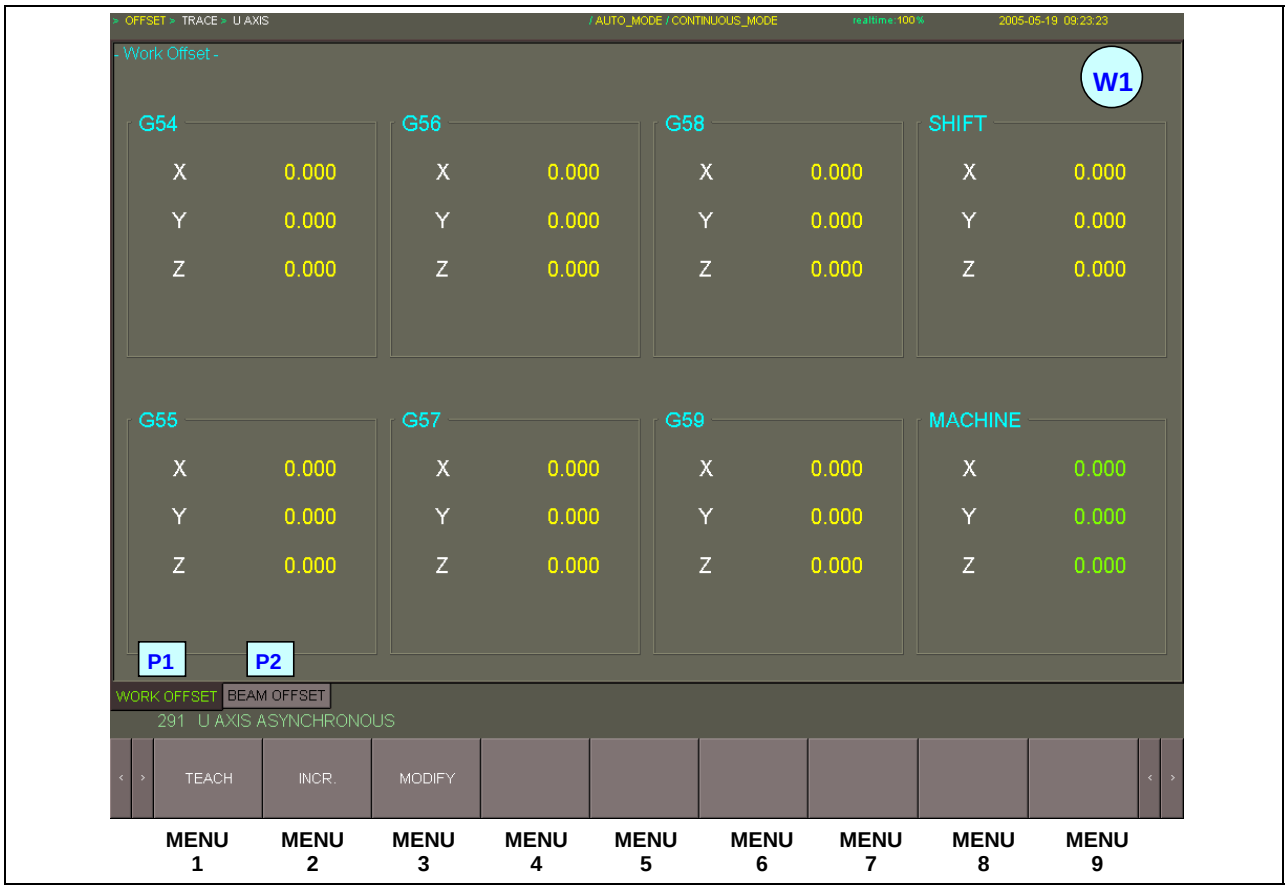


Fig. 2-13 **OFFSET** screen

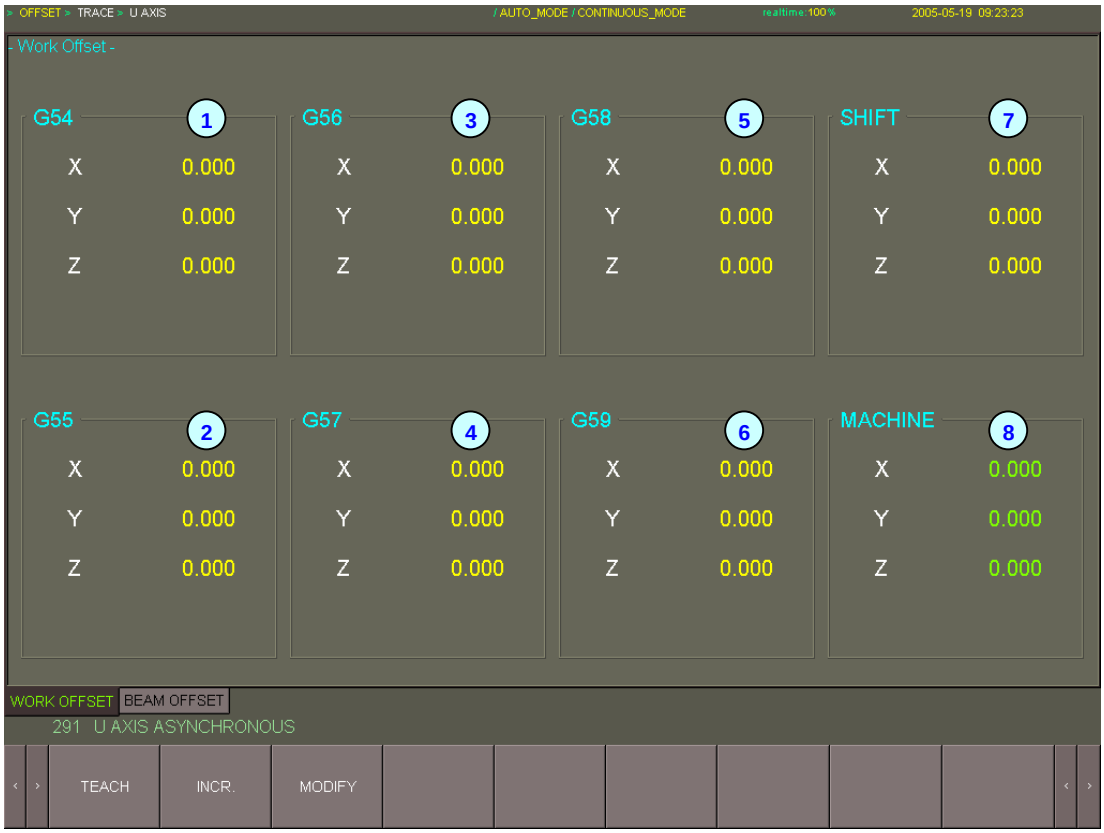
Screen display

Win-Page	Item	Description
W1-P1	WORK OFFSET	Offset data of work coordinate systems G54 - G59
W1-P2	BEAM OFFSET	Beam radius offset data

Menu description

Menu	Item	Description
1	TEACH	The command for modifying the offset data specified by the cursor (Enter the value to be increased or decreased from the current machine position.)
2	INCR.	The command for modifying the offset data specified by the cursor (Enter the incremental value in reference to the current value.)
3	MODIFY	The command for modifying the offset data specified by the cursor (Enter the coordinate value that the current position should take.)
4		
5		
6		
7		
8		
9		

1. WORK OFFSET page

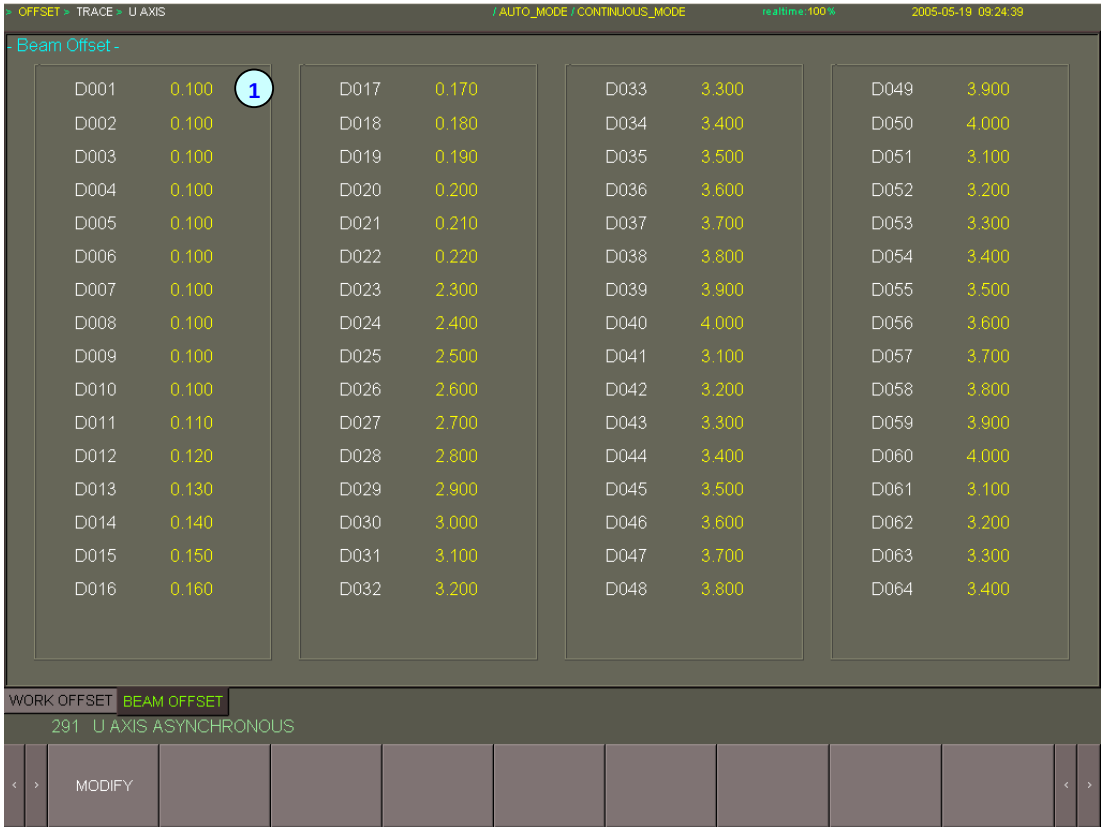

> OFFSET > TRACE > U AXIS
/ AUTO_MODE / CONTINUOUS_MODE
realtime:100%
2005-05-19 09:23:23
- Work Offset -
G54 1 X 0.000 Y 0.000 Z 0.000
G56 3 X 0.000 Y 0.000 Z 0.000
G58 5 X 0.000 Y 0.000 Z 0.000
SHIFT 7 X 0.000 Y 0.000 Z 0.000
G55 2 X 0.000 Y 0.000 Z 0.000
G57 4 X 0.000 Y 0.000 Z 0.000
G59 6 X 0.000 Y 0.000 Z 0.000
MACHINE 8 X 0.000 Y 0.000 Z 0.000
WORK OFFSET
BEAM OFFSET
291 U AXIS ASYNCHRONOUS
TEACH
INCR.
MODIFY

Display items

No.	Data Name	Display Range	Unit		Description
1	G54	±99999.999 ±9999.9999	mm inch		Worksheet reference position in the G54 machine coordinate system
2	G55	±99999.999 ±9999.9999	mm inch		Worksheet reference position in the G55 machine coordinate system
3	G56	±99999.999 ±9999.9999	mm inch		Worksheet reference position in the G56 machine coordinate system
4	G57	±99999.999 ±9999.9999	mm inch		Worksheet reference position in the G57 machine coordinate system
5	G58	±99999.999 ±9999.9999	mm inch		Worksheet reference position in the G58 machine coordinate system
6	G59	±99999.999 ±9999.9999	mm inch		Worksheet reference position in the G59 machine coordinate system
7	SHIFT	±99999.999 ±9999.9999	mm inch		Shift amount of G54 to G59 and G92 coordinate systems
8	MACHINE	±99999.999 ±9999.9999	mm inch		Current tool position in the machine coordinate system

2. BEAM OFFSET page

On the **BEAM OFFSET** page of the offset screen, you can register the beam radius offset data that is called by “G41D_” or “G42D_”. Enter the offset data corresponding to the offset number used in a program.



Display items

No.	Data Name	Display Range	Unit		Description
1	BEAM OFFSET	0 - 9.999 0 - 0.9999	mm inch		Beam radius offset values (Max. 64 values)

2-6-6 Tracer adjustment screen

The tracer adjustment screen is provided for adjusting the tracer.

The CNC reads the voltage the tracer outputs and displays the Distance - Voltage characteristics graph.

Fig. 2-14 Tracer adjustment screen

Screen display

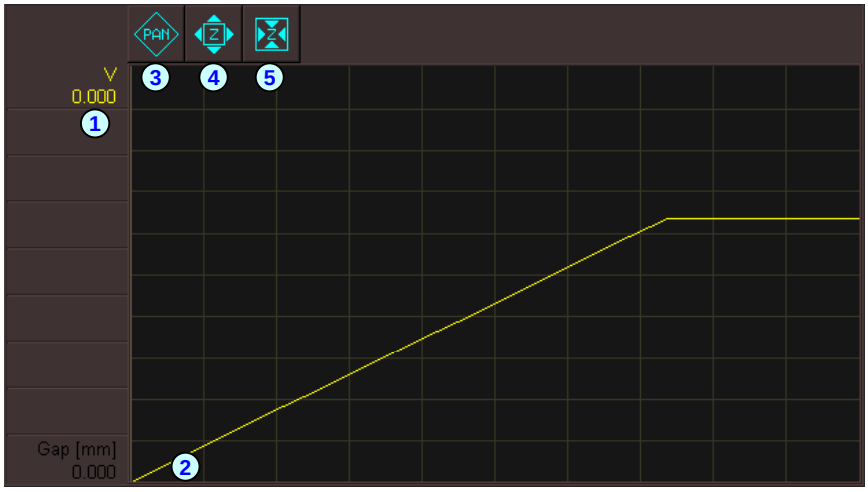
Win-Page	Item	Description
W1-P1 *1	TRACER STATUS	Tracer voltage
W2	Graphic	Distance - Voltage characteristics graph of the tracer
W3-P1	MACHINE POSITION	Machine position in the machine coordinate system
W4-P1	TRACER PARAMETER	Tracer voltage at each gap (nozzle to worksheet distance)

*1: Refer to the **TRACE** page of the **COMMAND** screen.

Menu description

Menu	Item	Description
1		
2		
3		
4		
5		
6		
7	ORIGIN Z	The command for resetting the **ORG-Z** data to “0.000”
8	FINISH SETTING	The command for saving the set values Press this menu key after completing adjustment.
9	SET PARAM	The command for reading the tracer output voltage Press this menu key at each point where the voltage is read. The voltage corresponding to the gap at the pressed point is displayed.

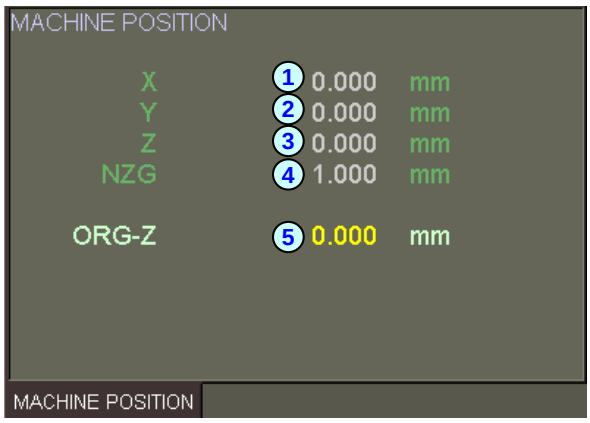
1. Graphic page



Display items

No.	Data Name	Display Range	Unit		Description
1	Voltage	±99.999	V		Tracer output voltage
2	Gap	0 - 99.999	mm		Distance between the nozzle and the worksheet
3	PAN	-	-		The icon to pan the graph using the cursor
4	ZOOM IN	-	-		The icon to enlarge the graph using the cursor
5	ZOOM OUT	-	-		The icon to reduce the graph using the cursor

2. MACHINE POSITION page



Display items

No.	Data Name	Display Range	Unit		Description
1	Machine position X	±99999.999 ±9999.9999	mm inch		Current position of the X-axis in the machine coordinate system
2	Machine position Y	±99999.999 ±9999.9999	mm inch		Current position of the Y-axis in the machine coordinate system
3	Machine position Z	±99999.999 ±9999.9999	mm inch		Current position of the Z-axis in the machine coordinate system
4	NZG	0 - 9.999	mm		Distance between the nozzle and the worksheet
5	ORG-Z	0 - 99.999 0 - 9.9999	mm inch		Distance of the Z-axis from the point where the **[ORIGIN Z]** menu key is pressed

3. TRACER PARAMETER page

Display items

No.	Data Name	Display Range	Unit		Description
1	Gap	0 - 99.999	mm		Distance between the nozzle and the worksheet
2	Volt	±99.999	V		Voltage set for tracing Voltage value measured when the **[SET PARAM]** menu key is pressed.

2-6-7 U-axis adjustment screen (available only for HG series)

On the U-axis adjustment screen, you can make U-axis adjustment for shifting the beam length so that the constant beam length is maintained.

1. Setting the beam length offset value
2. U-axis status display

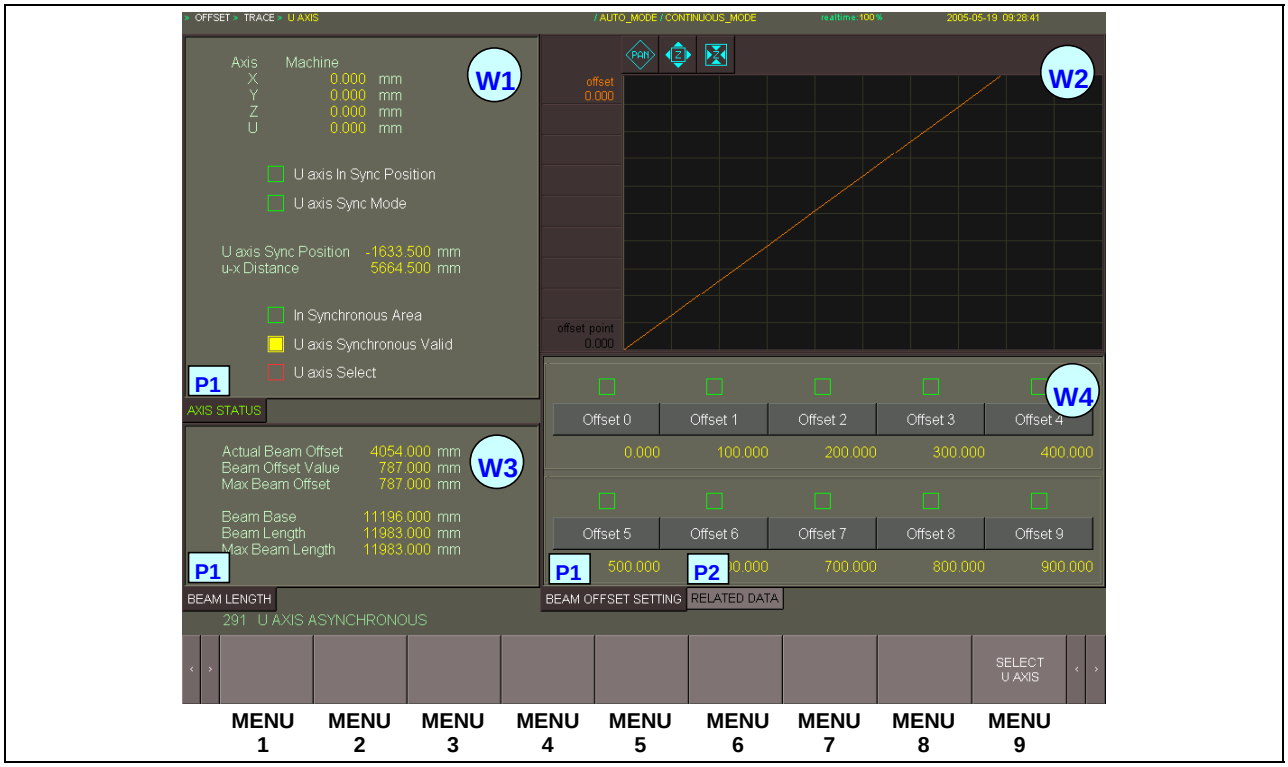


Fig. 2-15 U-axis adjustment screen (available only for HG series)

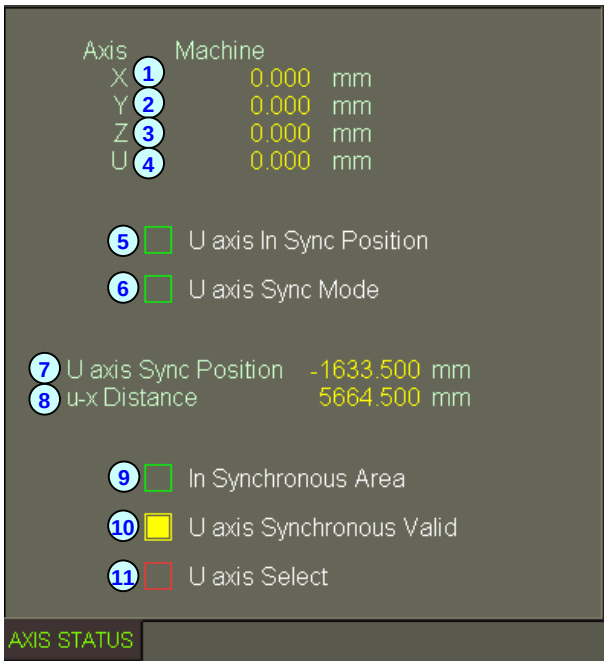
Screen display

Win-Page	Item	Description
W1-P1	AXIS STATUS	U-axis coordinate value
W2	Graphic	Beam length offset data, displayed in graph
W3-P1	BEAM LENGTH	Beam length display
W4-P1	BEAM OFFSET SETTING	Setting of beam length offset data (Move the U-axis and press the [OFFSET] button to set the offset value.)
W4-P2	RELATED DATA	Diagram that shows the relationship between the U-axis parameters and the beam length

Menu description

Menu	Item	Description
1		
2		
3		
4		
5		
6		
7		
8		
9	SELECT U AXIS	The command for selecting the U-axis for U-axis adjustment It is possible to move the U-axis by operating the X-axis handle.

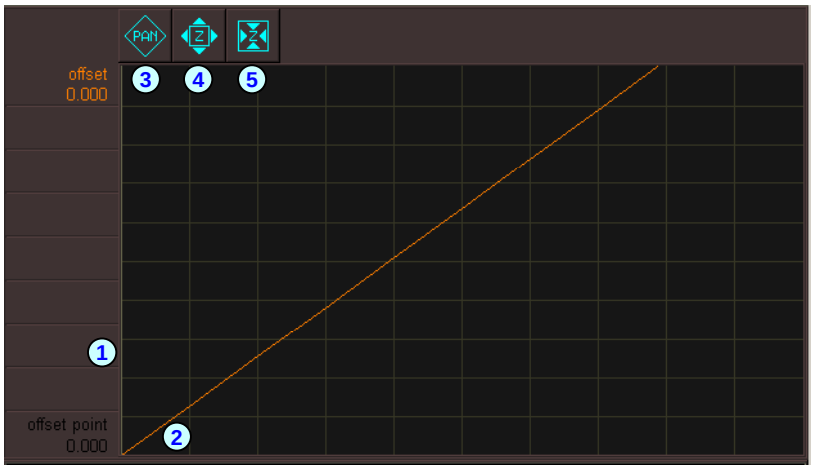
1. AXIS STATUS page


Axis
Machine
X 1 0.000 mm
Y 2 0.000 mm
Z 3 0.000 mm
U 4 0.000 mm
5 U axis In Sync Position
6 U axis Sync Mode
7 U axis Sync Position -1633.500 mm
8 u-x Distance 5664.500 mm
9 In Synchronous Area
10 U axis Synchronous Valid
11 U axis Select
AXIS STATUS

Display items

No.	Data Name	Display Range	Unit		Description
1	Machine position X	±99999.999 ±9999.9999	mm inch		Current position of the X-axis in the machine coordinate system
2	Machine position Y	±99999.999 ±9999.9999	mm inch		Current position of the Y-axis in the machine coordinate system
3	Machine position Z	±99999.999 ±9999.9999	mm inch		Current position of the Z-axis in the machine coordinate system
4	Machine position U	±99999.999 ±9999.9999	mm inch		Current position of the U-axis in the machine coordinate system
5	U axis In Sync Position	ON/OFF	-		Indication of the U-axis in the synchronized status (LED turns ON when the U-axis is in the synchronized status.)
6	U axis Sync Mode	ON/OFF	-		Indication of the U-axis in the synchronized mode status (LED turns ON when the U-axis synchronization command is ON.)
7	U axis Sync Position	±99999.999 ±9999.9999	mm inch		U-axis coordinate value of the position where it is set in synchronization.
8	u-x Distance	±99999.999 ±9999.9999	mm inch		Distance between the X- and U-axis
9	In Synchronous Area	ON/OFF	-		Indication that the U-axis is in the synchronous area (LED is ON when the U-axis is in the synchronization enabled area.)
10	U axis Synchronous Valid	ON/OFF	-		Indication of U-axis synchronization valid status (LED is ON when the U-axis is set valid by the parameter setting.)
11	U axis Select	ON/OFF	-		Indication that the U-axis is selected (LED is ON when the U-axis is selected. In this status, the U-axis can be moved by turning the X-axis handle.)

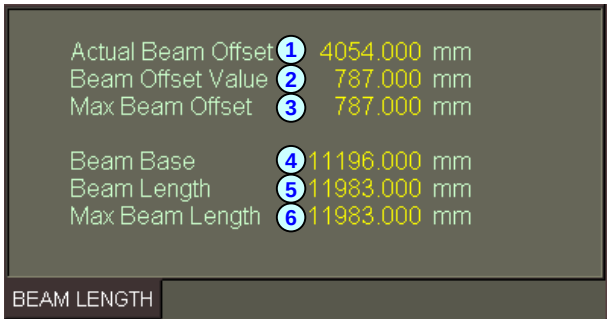
2. Graphic page



Display items

No.	Data Name	Display Range	Unit		Description
1	offset	0 - 9999.999 0 - 999.9999	mm inch		U-axis offset amount
2	Offset No.	1 - 10	-		U-axis offset number
3	PAN	-	-		The icon to pan the graph using the cursor
4	ZOOM IN	-	-		The icon to enlarge the graph using the cursor
5	ZOOM OUT	-	-		The icon to reduce the graph using the cursor

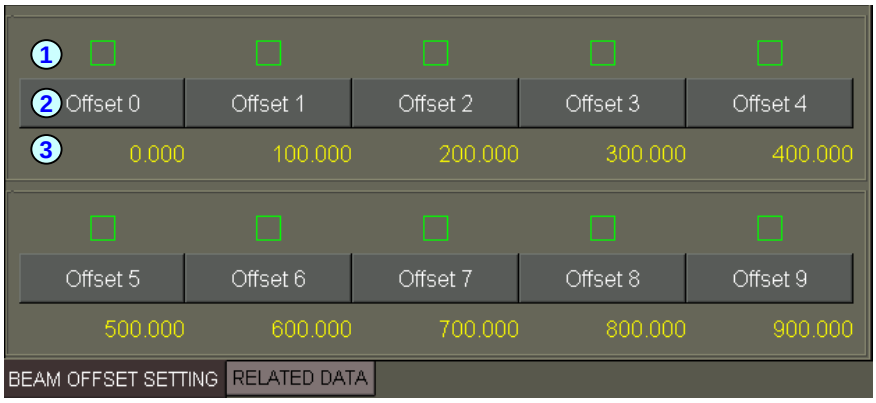
3. BEAM LENGTH page


Actual Beam Offset 1 4054.000 mm
Beam Offset Value 2 787.000 mm
Max Beam Offset 3 787.000 mm
Beam Base 4 11196.000 mm
Beam Length 5 11983.000 mm
Max Beam Length 6 11983.000 mm
BEAM LENGTH

Display items

No.	Data Name	Display Range	Unit		Description
1	Actual Beam Offset	0 - 99999.999 0 - 9999.9999	mm inch		Actual beam offset value
2	Beam Offset Value	0 - 99999.999 0 - 9999.9999	mm inch		Specified beam offset value
3	Max Beam Offset	0 - 99999.999 0 - 9999.9999	mm inch		The maximum beam offset value (The maximum offset value that can be specified)
4	Beam Base	0 - 99999.999 0 - 9999.9999	mm inch		Reference beam length (without offset)
5	Beam Length	0 - 99999.999 0 - 9999.9999	mm inch		Current beam length (offset included) 5 = 4 + 1
6	Max Beam Length	0 - 99999.999 0 - 9999.9999	mm inch		Maximum beam length (offset included) 6 = 4 + 3

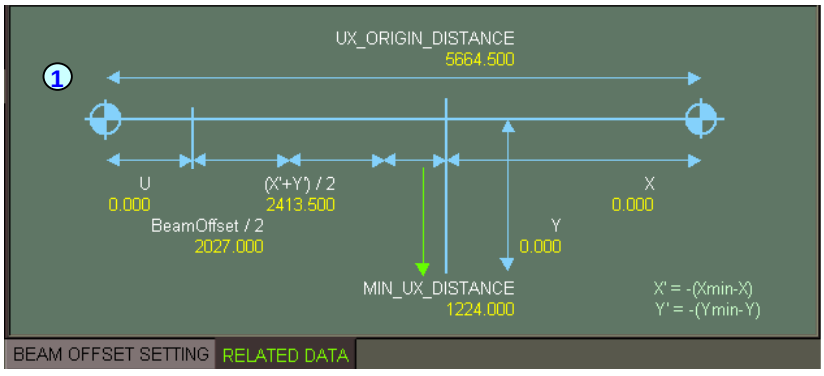
4. BEAM OFFSET SETTING page



Display items

No.	Data Name	Display Range	Unit		Description
1	Offset LED	ON/OFF	-		Indication of the offset selected status (LED turns ON for the currently selected offset number.)
2	Offset button	ON/OFF	-		Offset setting button (Press this button to set the offset value.)
3	Offset value	0 - 99999.999 0 - 9999.9999	mm inch		Offset value (The offset value that is active when this button is pressed is set.)

5. RELATED DATA page



Display items

No.	Data Name	Display Range	Unit		Description
1	U-axis related data diagram	-	-		The diagram showing the correlation among the U-axis parameters

2-6-8 User parameter screen

On the user parameter screen, you can set and check various parameters.

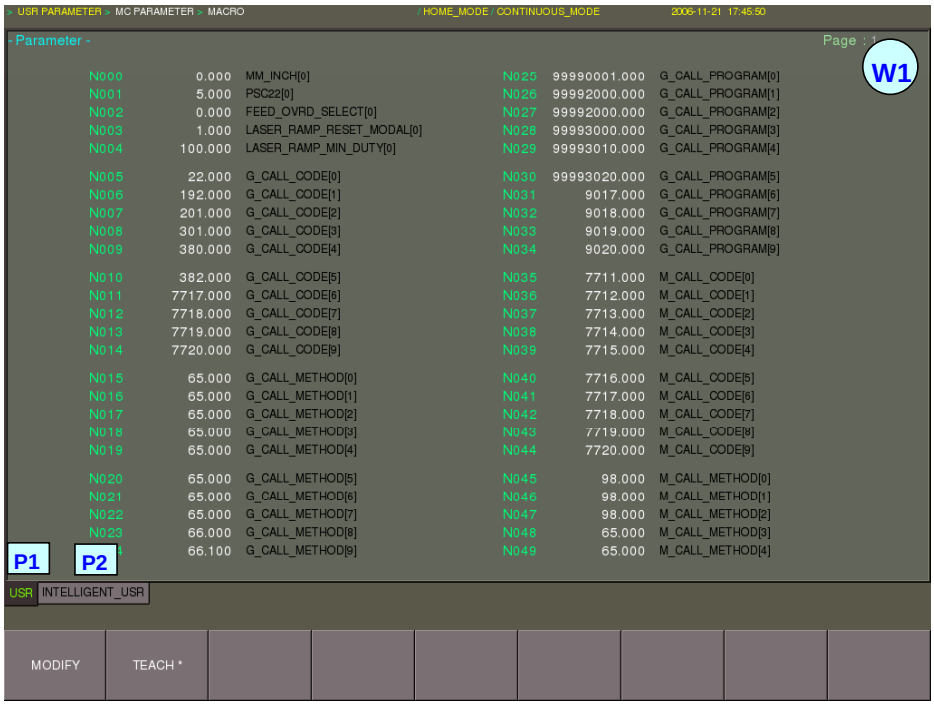


Fig. 2-16 User parameter screen

Screen display

Win-Page	Item	Description
W1-P1	USR	User parameter
W1-P2	INTELLIGENT_USR	Intelligent user parameter

Menu description

Menu	Item	Description
1	MODIFY	The command for setting a parameter value
2	TEACH	The command for setting the current machine position to the parameter suffixed with [*]
3		
4		
5		
6		
7		
8		
9		

2-6-9 Machine parameter screen

On the machine parameter screen, you can check machine parameters.

Note that machine parameters cannot be changed.

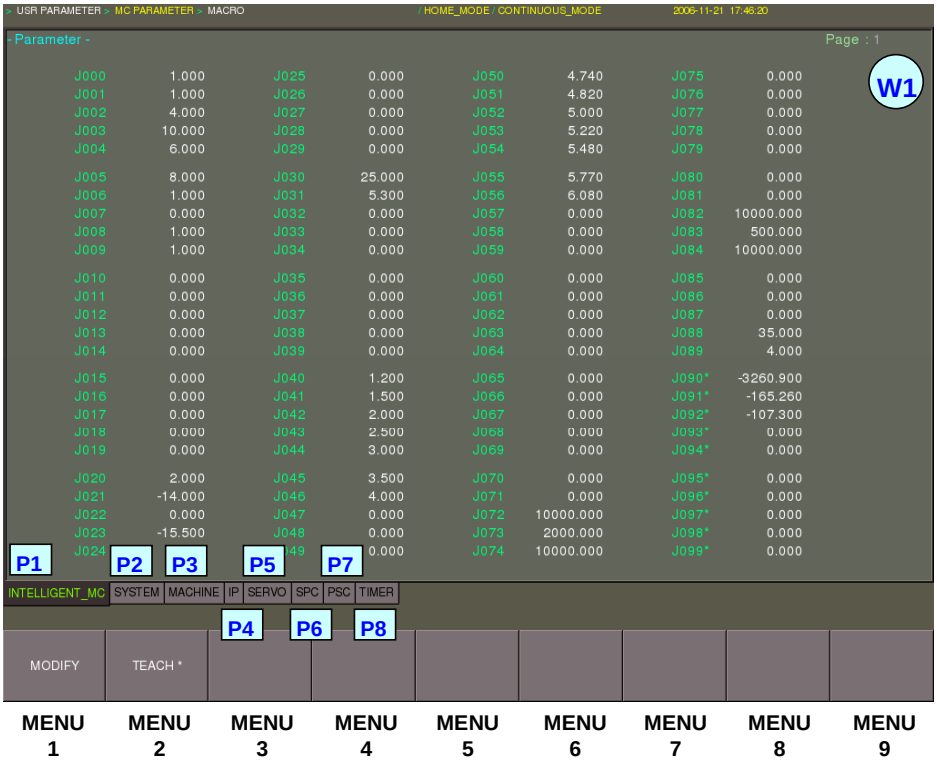


Fig. 2-17 Machine parameter screen

Screen display

Win-Page	Item	Description
W1-P1	INTELLIGENT_MC	Intelligent machine parameter
W1-P2	SYSTEM	System parameter
W1-P3	MACHINE	Machine parameter
W1-P4	IP	Interpolation parameter
W1-P5	SERVO	Servo parameter
W1-P6	SPC	SPC parameter
W1-P7	PSC	Sequence parameter
W1-P8	TIMER	Timer

Menu description

Menu	Item	Description
1	MODIFY	The command for setting a parameter value
2	TEACH	The command for setting the current machine position to the parameter suffixed with [*]
3		
4		
5		
6		
7		
8		
9		

2-6-10 MACRO VARIABLE screen

On the **MACRO VARIABLE (COMMON)** screen, you can set and check the macro (common) variables.

Fig. 2-18 **MACRO VARIABLE (COMMON)** screen

Screen display

Win-Page	Item	Description
W1-P1	COMMON	Display and setting of user macro common variables
W1-P2	LOCAL	Display of macro variables

Menu description

Menu	Item	Description
1	MODIFY	The command for modifying the macro variable on the cursor line
2	CLEAR	The command for clearing the macro variable on the cursor line
3		
4		
5		
6		
7		
8		
9		

On the **MACRO VARIABLE (LOCAL)** screen, you can check the local variables.

Fig. 2-19 **MACRO VARIABLE (LOCAL)** screen

For the displayed items and the menu, refer to the explanation for the **MACRO VARIABLE (COMMON)** screen.

2-6-11 Cutting technology screen

On the cutting technology screen, you can operate the cutting condition file. Cutting conditions consist of two types - common and specific cutting conditions - and you can edit only the common cutting conditions using this screen. (The example below shows the screen of the HG series.)

1. Creation of new common cutting condition file and editing of the common cutting conditions
2. Copying, searching, renaming and deleting common cutting condition file

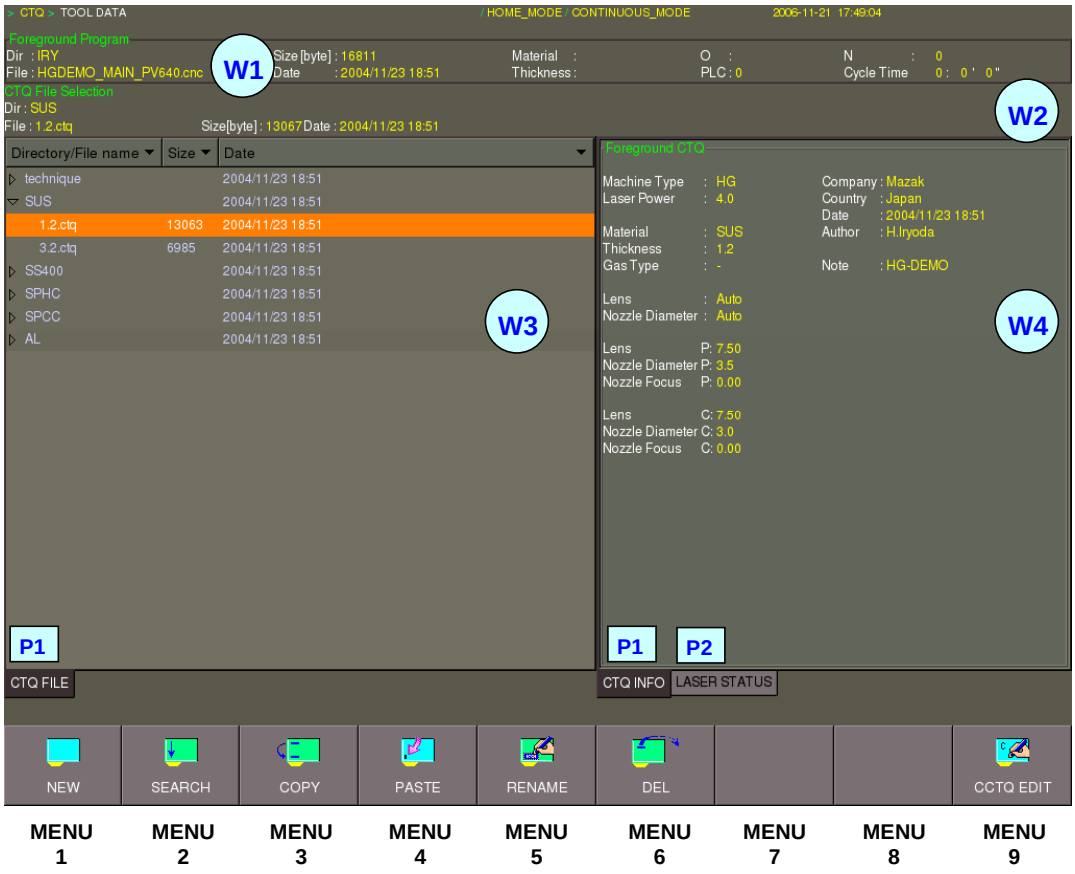


Fig. 2-20 Cutting technology screen

Screen display

Win-Page	Item	Description
W1	Foreground Program *1	Attribute data of the program for automatic operation (foreground program)
W2	CTQ File Section *2	Attribute data of the cutting condition file (CTQ file) selected by the cursor
W3-P1	CTQ FILE	List of common cutting condition files
W4-P1	CTQ INFO	Contents of the selected cutting condition file
W4-P2	LASER STATUS	Current laser status

*1: Refer to the **Foreground Program** window of the **COMMAND** screen.

*2: CTQ: This stands for Cutting Technology and indicates cutting conditions.

Menu description

Menu	Item	Description
1	NEW	The command for creating a new cutting condition file
2	SEARCH	The command for searching a cutting condition file
3	COPY	The command for copying a cutting condition file
4	PASTE	The command for pasting a cutting condition file
5	RENAME	The command for renaming a cutting condition file
6	DEL	The command for deleting a cutting condition file
7		
8		
9	CCTQ EDIT	The command to open the common cutting condition popup window allowing you to edit the cutting condition data

2-6-12 TOOL DATA screen

On the **TOOL DATA** screen, you can set the tool data for the torch magazine and the nozzle magazine.

Select appropriate torches and nozzles according to the machine setting.

(Contents displayed on the screen differ depending on machine models. The example below shows the screen of the HG510 (4-tool magazine specification). For details, refer to Operating Manual for INTELLIGENT LOOP SYSTEM.)

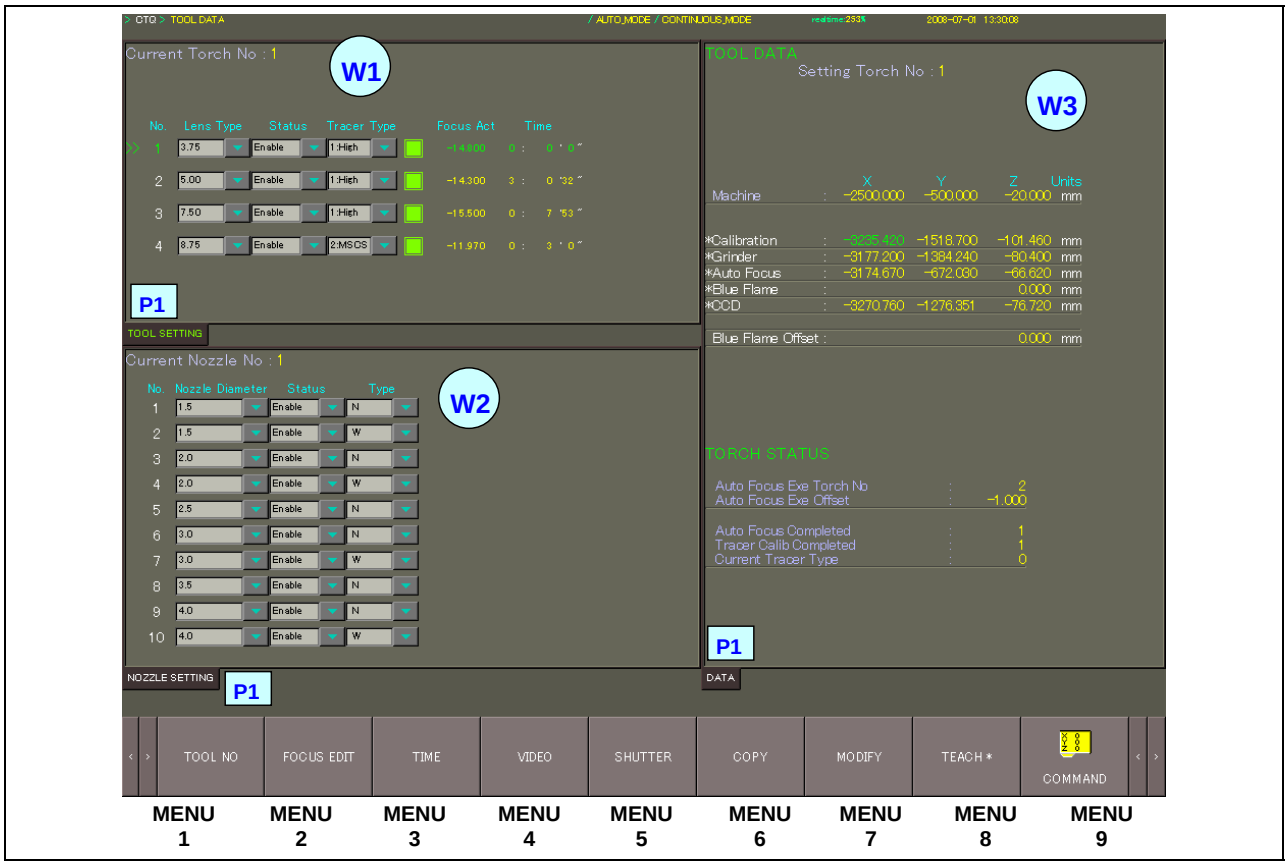


Fig. 2-21 **TOOL DATA** screen

Screen display

Win-Page	Item	Description
W1-P1	TOOL SETTING *1, *2	Setting of the torch size according to the torch that is set in the torch holder.
W2-P1	NOZZLE SETTING	Setting of the nozzle diameter and type according to the nozzle that is set in the nozzle holder.
W3-P1	DATA	Setting of the intelligent function and the status of the currently set tool

*1: Select “0.00” in the Lens Type for the torch holder where no torch is set. Inconsistency between the torch set status and the sensor status will cause an alarm.

*2: Whether the torch holder has a torch or not is detected by the sensor. The LED turns on when a torch exists. If a torch does not exist, the LED turns off.

Menu description

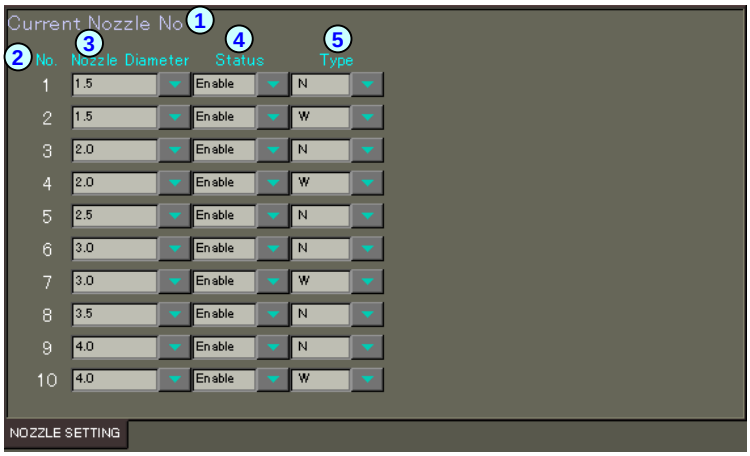
Menu	Item	Description
1	TOOL NO	The command for editing the current tool number
2	FOCUS EDIT	The command for editing the focus of the torch
3	TIME	The command for clearing the tool use time.
4	VIDEO	The command for taking a movie of the nozzle by the CCD camera
5	SHUTTER	The command for taking a picture of the nozzle by the CCD camera
6	COPY	The command for copying the coordinates already set for other torch according to the setting of the intelligent function.
7	MODIFY	The command for setting the coordinates of the respective intelligent functions.
8	TEACH	The command for setting the current coordinates to the respective intelligent functions.
9	COMMAND	The command for transferring the screen to the **COMMAND** screen

1. TOOL SETTING page

Display items

No.	Data Name	Display Range	Unit		Description
1	Current Torch No	1 - 4	—		Current torch number
2	No.	1 - 4	—		Torch number
3	Lens Type	0.00 - 108.75	inch		Torch (lens) type Select the type of torch set in the holder. Select “0.0” when a torch is not set in the holder.
4	Status	Enable/Disable	—		Status of the torch
5	Tracer Type	0 - 2	—		Selection of tracer type 0: None 1: High 2: MSCS (option)
6	Torch LED	—	—		Lights when the torch exists.
7	Focus Act	0 - –19.000	mm		Focal point position (Focal point of each torch is displayed.)
8	Time	0:0:0 - 999:59:59	H:M:S		Torch used time

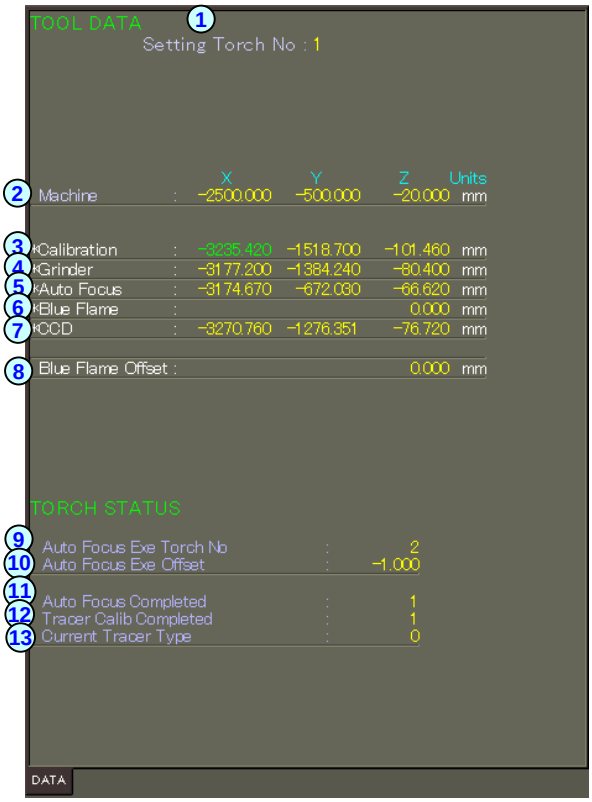
2. NOZZLE SETTING page



Display items

No.	Data Name	Display Range	Unit		Description
1	Current Nozzle No	1 - 10	—		Current nozzle number
2	No.	1 - 10	—		Nozzle number
3	Nozzle Diameter	0 - 4.0	mm		Nozzle size (Nozzle diameter) Select “0.0” when a nozzle is not set in the nozzle magazine.
4	Status	—	—		Status
5	Type	—	—		Nozzle type N: Normal W: W nozzle SN: Normal (slim nozzle) SW: W nozzle (slim nozzle)

3. DATA page


TOOL DATA
1
Setting Torch No : 1
X
Y
Z
Units
2 Machine : -2500.000 -500.000 -20.000 mm
3 *Calibration : -3235.420 -1518.700 -101.460 mm
4 *Grinder : -3177.200 -1384.240 -80.400 mm
5 *Auto Focus : -3174.670 -672.080 -66.620 mm
6 *Blue Flame : 0.000 mm
7 *CCD : -3270.760 -1276.351 -76.720 mm
8 Blue Flame Offset : 0.000 mm
TORCH STATUS
9 Auto Focus Exe Torch No : 2
10 Auto Focus Exe Offset : -1.000
11 Auto Focus Completed : 1
12 Tracer Calib Completed : 1
13 Current Tracer Type : 0
DATA

Display items

No.	Data Name	Display Range	Unit		Description
1	Setting Torch No	1 - 4	—		Currently selected torch number
2	Machine	±99999.999 ±9999.9999	mm inch		Current machine position
3	Calibration	±99999.999 ±9999.9999	mm inch		Calibration position
4	Grinder	±99999.999 ±9999.9999	mm inch		Grinder position
5	Auto Focus	±99999.999 ±9999.9999	mm inch		Auto focus position
6	Blue Flame	±99999.999 ±9999.9999	mm inch		Coordinate of blue flame
7	CCD	±99999.999 ±9999.9999	mm inch		CCD position
8	Blue Flame Offset	±99999.999 ±9999.9999	mm inch		Blue flame offset value
9	Auto Focus Exe Torch No	1 - 4	—		Torch number for which auto focus is executed
10	Auto Focus Exe Offset	5 - –19.000	mm		Offset value when auto focus is executed
11	Auto Focus Completed	0 - 1	—		Auto focus completed status 0: Not completed, 1: Completed
12	Tracer Calib Completed	0 - 1	—		Tracer calibration completed status 0: Not completed, 1: Completed
13	Current Tracer Type	0 - 2	—		Current tracer type

2-6-13 GRAPHIC screen

On the **GRAPHIC** screen, you can check the tool path of the foreground program. For the display of tool path, two display modes are available - 2D graphic display mode and 3D graphic display mode.

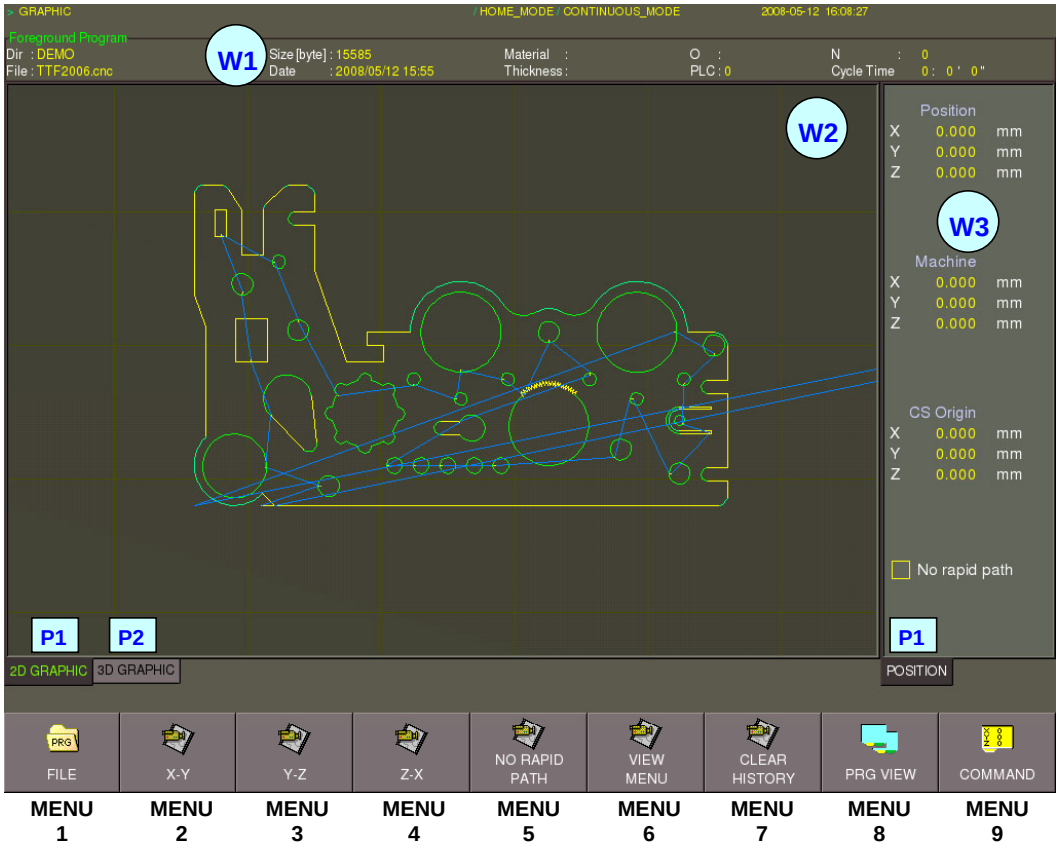


Fig. 2-22 **GRAPHIC** screen

Screen display

Win-Page	Item	Description
W1	Foreground Program *1	Attribute data of the program for automatic operation (foreground program)
W2-P1	2D GRAPHIC	2D graphic display of tool path on the X-Y plane
W2-P2	3D GRAPHIC	3D graphic display of tool path
W3-P1	POSITION	Display of coordinate values (Current coordinate values, axis position in the machine coordinate system, origin of the currently selected coordinate system)

*1: Refer to the **Foreground Program** window of the **COMMAND** screen.

Menu description

Menu	Item	Description
1	FILE	The command for modifying the foreground program
2	X-Y	The command for selecting the tool path drawing plane (X-Y plane) (3D graphic)
3	Y-Z	The command for selecting the tool path drawing plane (Y-Z plane) (3D graphic)
4	Z-X	The command for selecting the tool path drawing plane (Z-X plane) (3D graphic)
5	NO RAPID PATH	The command for switching whether or not rapid feed path is displayed.
6	VIEW MENU	The command for memorizing the graphic display setting (view setting)
7	CLEAR HISTORY	The command for clearing the tool path drawn on the previous day
8	PRG VIEW	The command for displaying the program monitor
9	COMMAND	The command for transferring the screen to the **COMMAND** screen

2-6-14 DATA I/O screen

Using the **DATA I/O** screen, save/load of the data such as programs and parameters is possible between the USB memory device and the CNC.

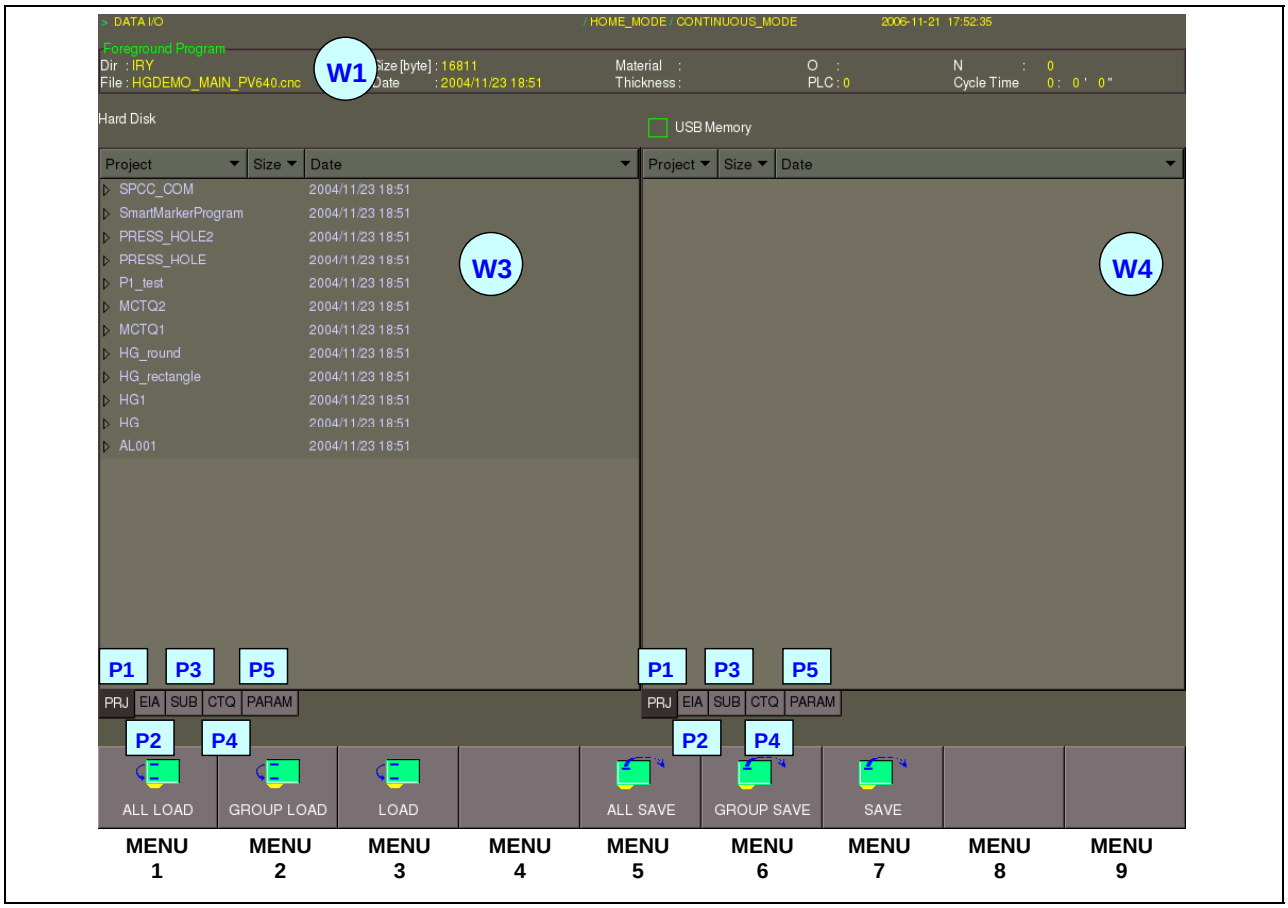


Fig. 2-23 **DATA I/O** screen

Screen display

Win-Page	Item	Description
W1	Foreground Program *1	Attribute data of the program for automatic operation (foreground program)
W3-P1	PRJ	List of Intelligent programs stored in the CNC
W3-P2	EIA	List of EIA programs stored in the CNC
W3-P3	SUB	List of EIA common subprograms stored in the CNC
W3-P4	CTQ	List of cutting condition files stored in the CNC
W3-P5	PARAM	List of parameter files stored in the CNC
W4-P1	PRJ	List of Intelligent programs stored in the USB memory device
W4-P2	EIA	List of EIA programs stored in the USB memory device
W4-P3	SUB	List of EIA common subprograms stored in the USB memory device
W4-P4	CTQ	List of cutting condition files stored in the USB memory device
W4-P5	PARAM	List of parameter files stored in the USB memory device

*1: Refer to the **Foreground Program** window of the **COMMAND** screen.

Menu description

Menu	Item	Description
1	ALL LOAD	The command for loading all programs from the USB memory device to the CNC
2	GROUP LOAD	The command for loading all the data in the specified page from the USB memory device to the CNC
3	LOAD	The command for loading the data specified by the cursor from the USB memory device to the CNC
4		
5	ALL SAVE	The command for saving all programs from the CNC to the USB memory device
6	GROUP SAVE	The command for saving all the data in the specified page from the CNC to the USB memory device
7	SAVE	The command for saving the data specified by the cursor from the CNC to the USB memory device
8		
9		

2-6-15 ALARM screen

By displaying the **ALARM** screen, you can check detailed information of the currently active alarms.

It is also possible to check the history of the past alarms.

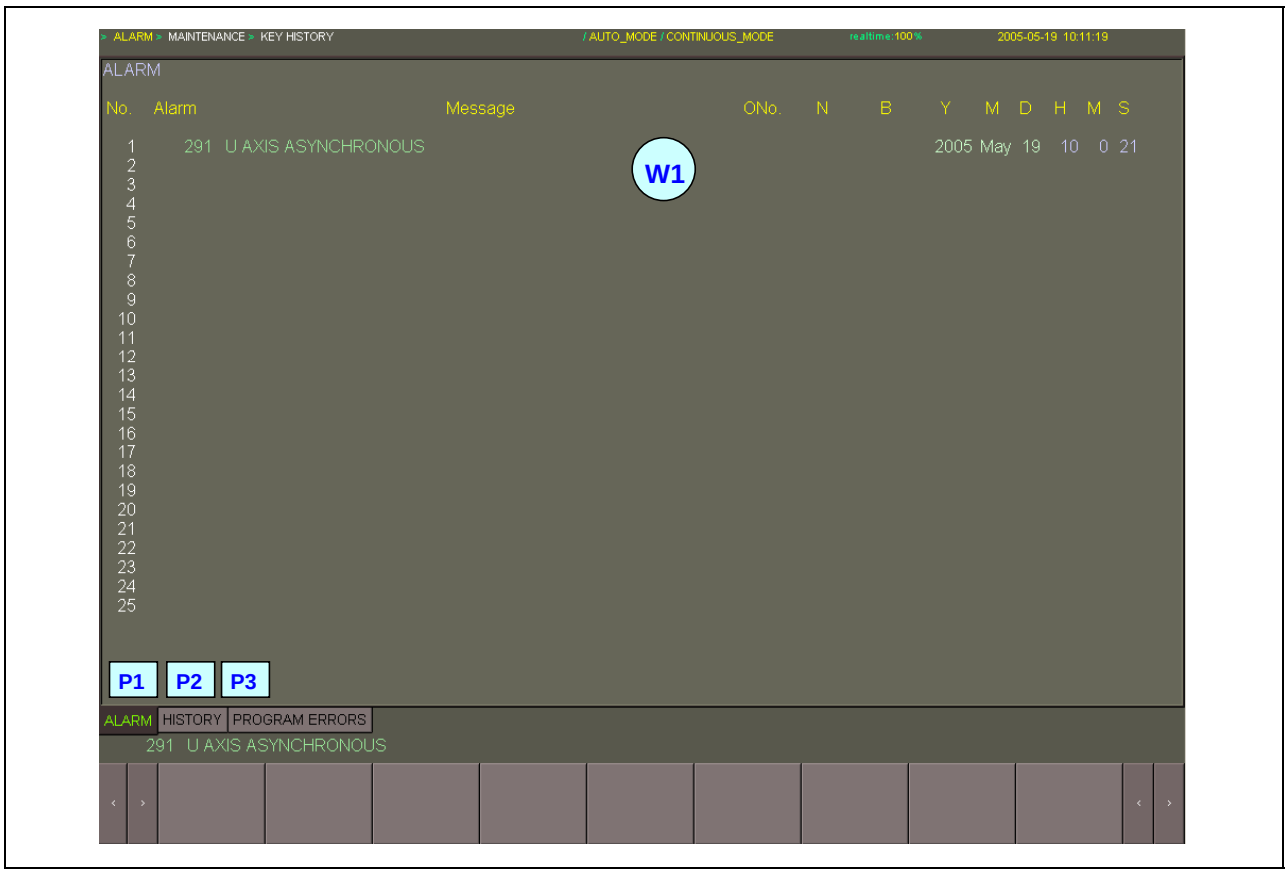


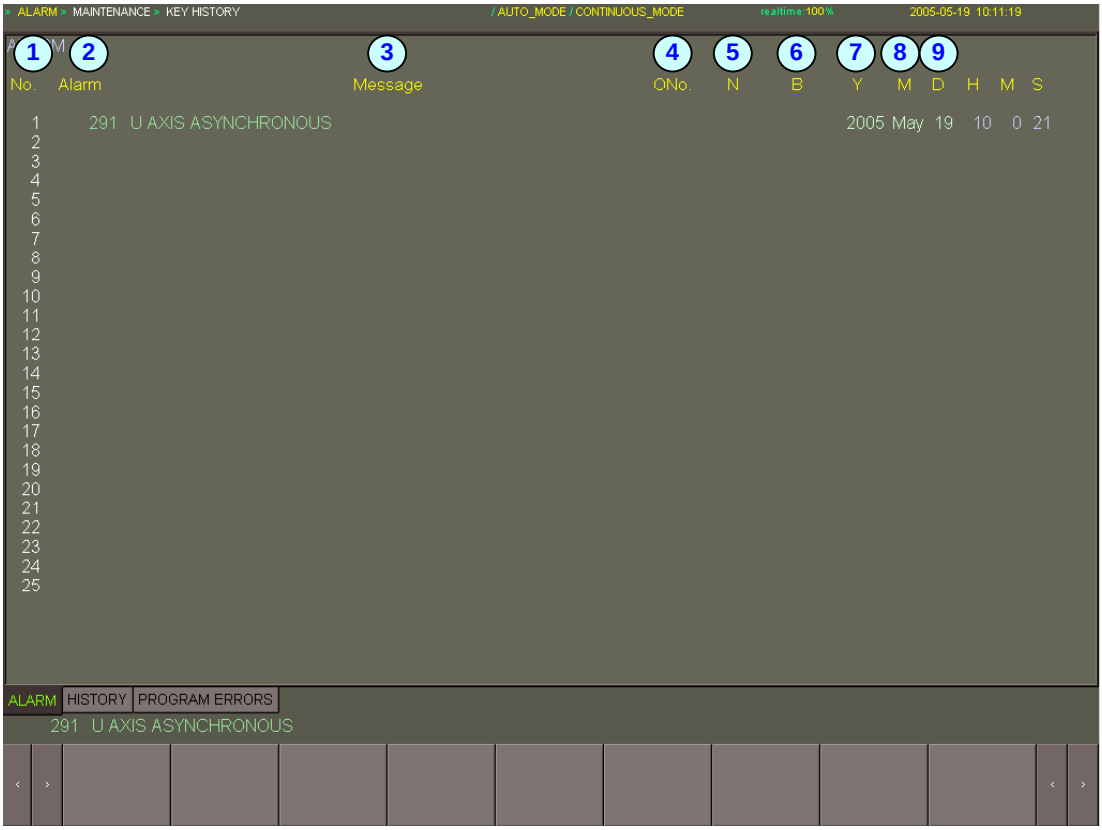
Fig. 2-24 **ALARM** screen

Screen display

Win-Page	Item	Description
W1-P1	ALARM	Currently active alarms (Displays up to 25 alarms.)
W1-P2	HISTORY	History of the past alarms (Displays up to 100 alarms.)
W1-P3	PROGRAM ERRORS	Display of program errors

1. ALARM page

On the **ALARM** page, you can check details of the currently active alarms.

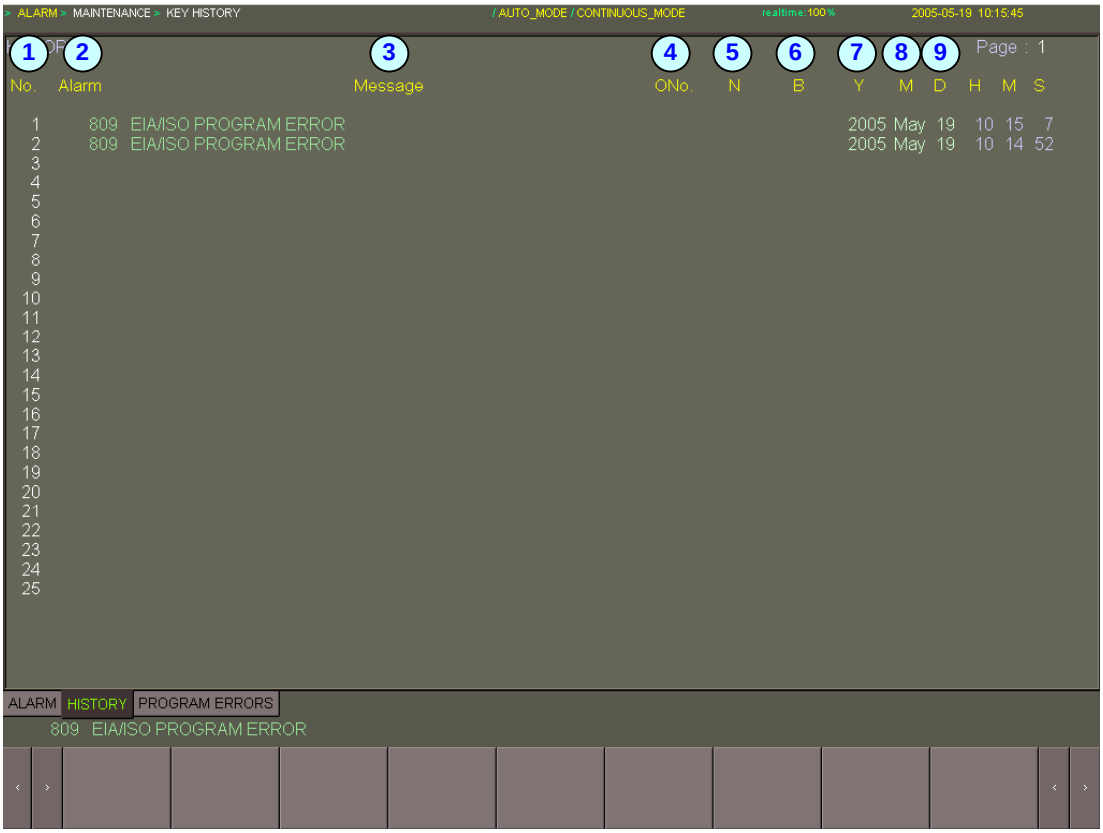


Display items

No.	Data Name	Display Range	Unit		Description
1	No.	1 - 25	-		Alarm sequence number currently displayed on the screen
2	Alarm	1 - 999999	-		Alarm number
3	Message	-	-		Alarm message
4	ONo.	1 - 99999999	-		The program number in which the alarm occurred
5	N	-	-		The sequence number in which the alarm occurred
6	B	-	-		The block number in which the alarm occurred
7	Y	2***	year		Year of the alarm occurrence
8	M	-	month		Month of the alarm occurrence
9	D	1 - 31	date		Day of the alarm occurrence

2. HISTORY page

On the **HISTORY** page, you can check details of the currently active alarms.



Display items

No.	Data Name	Display Range	Unit		Description
1	No.	1 - 100	-		Alarm sequence number currently displayed on the screen
2	Alarm	1 - 999999	-		Alarm number
3	Message	-	-		Alarm message
4	ONo.	1 - 99999999	-		The program number in which the alarm occurred
5	N	-	-		The sequence number in which the alarm occurred
6	B	-	-		The block number in which the alarm occurred
7	Y	2***	year		Year of the alarm occurrence
8	M	-	month		Month of the alarm occurrence
9	D	1 - 31	date		Day of the alarm occurrence

3. PROGRAM ERRORS page

On the **PROGRAM ERRORS** page, you can check details of the errors in the EIA program.

Display items

No.	Data Name	Display Range	Unit		Description
1	Alarm	1 - 100	-		Alarm number
2	Message	-	-		Alarm message
3	PLC	-	-		The line number of the program line in which the alarm occurred
4	WNo.	-	-		The program number in which the alarm occurred
5	SNo.	-	-		The sequence number in which the alarm occurred
6	BNo.	-	-		The block number in which the alarm occurred

2-6-16 MAINTENANCE screen

The **MAINTENANCE** screen displays the daily and periodical inspection items and the accumulated time.

ALARM > MAINTENANCE > KEY HISTORY
/ HOME_MODE / CONTINUOUS_MODE
2008-03-24 11:13:31
LASER ON TIME 0 H
PERIODIC. MAINT. INFO.
W1
NOW NEXT LAST
1. TIME TO EXCHANGE V/P OIL 0 / 750 (0)
2. TIME TO EXCHANGE T/B OIL 0 / 2000 (0)
3. TIME TO EXCHANGE V/P FILTER 0 / 2000 (0)
4. TIME TO EXCHANGE AIR FILTER IN CHILLER 0 / 2000 (0)
5. TIME TO EXCHANGE ELECTRODES 0 / 2000 (0)
6. TIME TO EXCHANGE PLASMA TUBES 0 / 2000 (0)
7. TIME TO EXCHANGE OUTPUT COUPLER 0 / 2000 (0)
8. TIME TO EXCHANGE REAR MIRROR 0 / 2000 (0)
9. TIME TO EXCHANGE INTERNAL BEND MIRRORS 0 / 2000 (0)
10. TIME TO EXCHANGE PHASE RETARDER 0 / 3000 (0)
11. TIME TO EXCHANGE EXTERNAL BEND MIRRORS 0 / 4000 (0)
12. TIME TO OVERHAUL VACUUM PUMP 0 / 4000 (0)
13. TIME TO OVERHAUL T/B 0 / 8000 (0)
14. TIME TO OVERHAUL H.V.TRANS. & CIRCUIT 0 / 8000 (0)
P1
P2
PERIODIC. MAINT. INFO.
START UP INSPECTION
UPDATE V/P OIL
UPDATE T/B OIL
UPDATE V/P FILTER
UPDATE AIR FILTER
MENU 1
MENU 2
MENU 3
MENU 4
MENU 5
MENU 6
MENU 7
MENU 8
MENU 9

Fig. 2-25 **MAINTENANCE** screen

Screen display

Win-Page	Item	Description
W1-P1	PERIODIC. MAINT. INFO.	Periodical inspection items
W1-P2	START UP INSPECTION	Daily inspection items

Menu description

Menu	Item	Description
1	UPDATE V/P OIL	Press this menu key after changing the vacuum pump oil. The **NEXT** data (next oil change time) is updated.
2	UPDATE T/B OIL	Press this menu key after changing the turbo blower oil. The **NEXT** data (next oil change time) is updated.
3	UPDATE V/P FILTER	Press this menu key after replacing the vacuum pump filter. The **NEXT** data (next filter replace time) is updated.
4	UPDATE AIR FILTER	Press this menu key after replacing the air filter. The **NEXT** data (next filter replace time) is updated.
5		
6		
7		
8		
9		

1. PERIODIC. MAINT. INFO. page

On the **PERIODIC. MAINT. INFO.** page, you can confirm the periodical inspection items and the accumulated time.

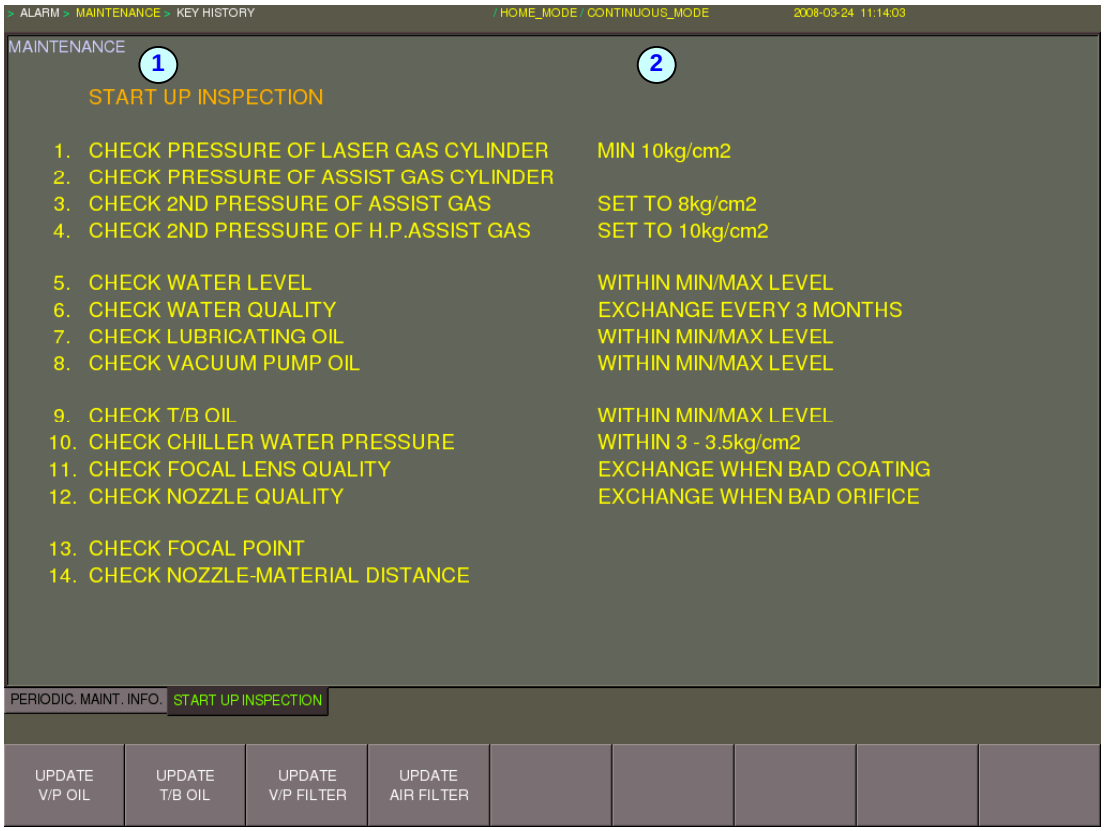
> ALARM > MAINTENANCE > KEY HISTORY
/ HOME_MODE / CONTINUOUS_MODE
2008-03-24 11:14:41
1
2
LASER ON TIME
3
00 H
4
5
PERIODIC. MAINT. INFO.
NOW
NEXT
LAST
1. TIME TO EXCHANGE V/P OIL 2500 / 750 (0)
2. TIME TO EXCHANGE T/B OIL 2500 / 2000 (0)
3. TIME TO EXCHANGE V/P FILTER 2500 / 2000 (0)
4. TIME TO EXCHANGE AIR FILTER IN CHILLER 2500 / 2000 (0)
5. TIME TO EXCHANGE ELECTRODES 2500 / 2000 (0)
6. TIME TO EXCHANGE PLASMA TUBES 2500 / 2000 (0)
7. TIME TO EXCHANGE OUTPUT COUPLER 2500 / 2000 (0)
8. TIME TO EXCHANGE REAR MIRROR 2500 / 2000 (0)
9. TIME TO EXCHANGE INTERNAL BEND MIRRORS 2500 / 2000 (0)
10. TIME TO EXCHANGE PHASE RETARDER 2500 / 3000 (0)
11. TIME TO EXCHANGE EXTERNAL BEND MIRRORS 2500 / 4000 (0)
12. TIME TO OVERHAUL VACUUM PUMP 2500 / 4000 (0)
13. TIME TO OVERHAUL T/B 2500 / 8000 (0)
14. TIME TO OVERHAUL H.V.TRANS. & CIRCUIT 2500 / 8000 (0)
PERIODIC. MAINT. INFO.
START UP INSPECTION
UPDATE V/P OIL
UPDATE T/B OIL
UPDATE V/P FILTER
UPDATE AIR FILTER

Display items

No.	Data Name	Display Range	Unit		Description
1	PERIODIC. MAINT. INFO.	-	-		Periodical inspection items
2	Gauge	-	-		The gauge showing the time having passed since the last maintenance Before 80% of maintenance interval: Green After 80% of maintenance interval: Yellow After 100% of maintenance interval: Red After 150% of maintenance interval: Magenta
3	NOW	0 - 99999	hour		Time having passed since the last maintenance
4	NEXT	0 - 99999	hour		Next periodical inspection time
5	LAST	0 - 99999	hour		The time when the periodical inspection was performed last

2. START UP INSPECTION page

On the **START UP INSPECTION** page, you can confirm the daily inspection items and the accumulated time.



Display items

No.	Data Name	Display Range	Unit		Description
1	START UP INSPECTION	-	-		Daily inspection items
2	Level	-	-		Confirmation level

2-6-17 KEY HISTORY screen

The **KEY HISTORY** screen displays the key entry record of the operating panel.

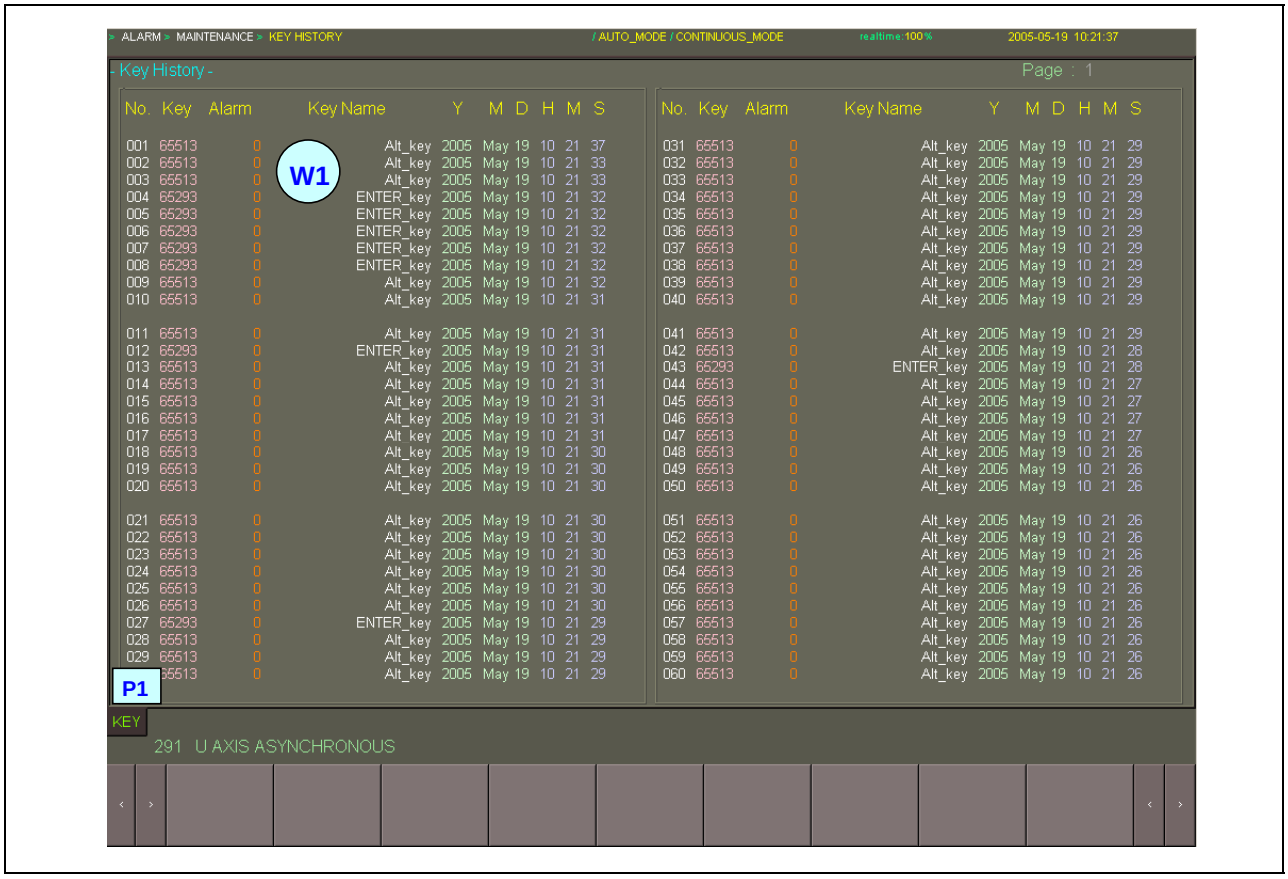


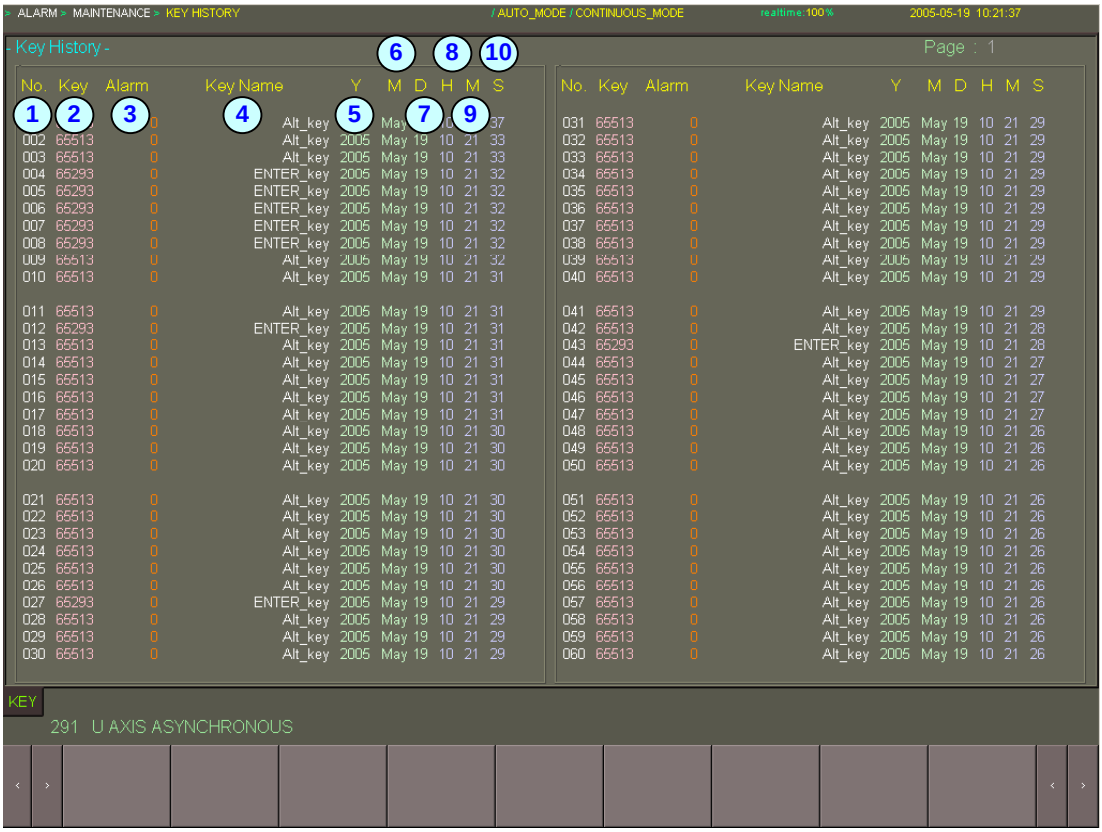
Fig. 2-26 **KEY HISTORY** screen

Screen display

Win-Page	Item	Description
W1-P1	KEY	Display of key operation record (Max. 60 steps of operation)

1. KEY page

The key entry record of the operating panel is displayed.


ALARM > MAINTENANCE > KEY HISTORY
/ AUTO_MODE / CONTINUOUS_MODE
realtime 100 %
2005-05-19 10:21:37
- Key History -
Page : 1
No. Key Alarm Key Name Y M D H M S
1 2 3 4 5 6 7 8 9 10
KEY
291 U AXIS ASYNCHRONOUS

Display items

No.	Data Name	Display Range	Unit		Description
1	No.	1 - 60	-		Serial number
2	Key	1 - 999999	-		Key number
3	Alarm	-	-		Alarm number
4	Key Name	-	-		Key name
5	Y	2***	year		Year of the key operation
6	M	-	month		Month of the key operation
7	D	1 - 31	date		Day of the key operation
8	H	0 - 24	hour		Hour of the key operation
9	M	0 - 60	min		Minute of the key operation
10	S	0 - 60	sec		Second of the key operation

2-6-18 SWITCH screen

Various machine operation buttons are arranged on the **SWITCH** screen.

(Contents of buttons/switches to be displayed differ depending on machine models and selected options.)

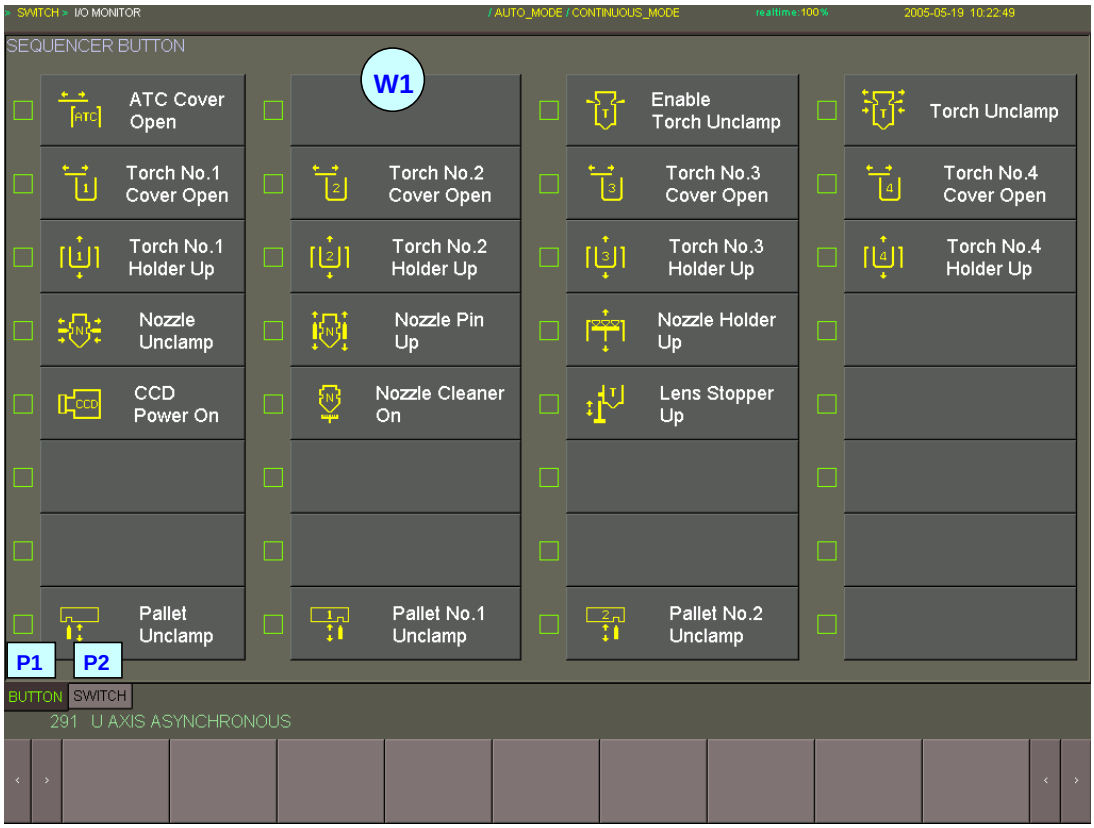



Fig. 2-27 **SWITCH** screen

Screen display

Win-Page	Item	Description
W1-P1 *1	BUTTON	Display of manual operation buttons (Operates various kinds of actuators.)
W1-P2 *1	SWITCH	Display of switch parameters (Can switch the setting for the option selection parameters and the operation selection parameters.)

*1: Contents differ depending on machine model.

1. BUTTON page

(Contents of buttons/switches to be displayed differ depending on machine models and selected options.)

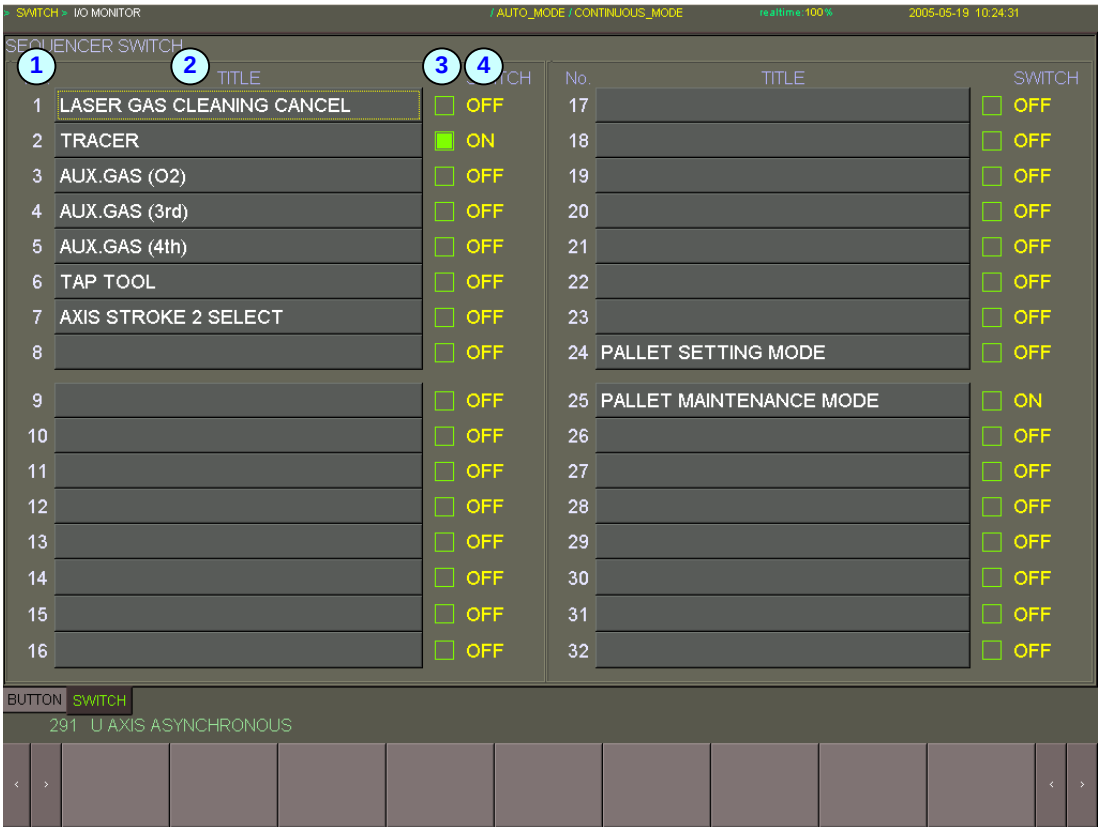
Display items

No.	Data Name	Display Range	Unit		Description
1	LED	ON/OFF	-		Indication of the ON/OFF status of each button
2	Button	-	-		Button name (Operation is performed as the button is pressed.) *1

*1: Contents differ depending on machine model.

2. SWITCH page

(Contents of buttons/switches to be displayed differ depending on machine models and selected options.)



Display items

No.	Data Name	Display Range	Unit		Description
1	No.	1 - 32	-		Switch number
2	TITLE	-	-		Switch name *1
3	LED	ON/OFF	-		Indication of the ON/OFF status by LED
4	ON/OFF	ON/OFF	-		Indication of the ON/OFF status of each switch

*1: Contents differ depending on machine model.

2-6-19 I/O MONITOR screen

On the **I/O MONITOR** screen, you can check the status of the sensor signals, valve output signals, etc.

For addresses, refer to the electric drawing.

1. I/O MONITOR page

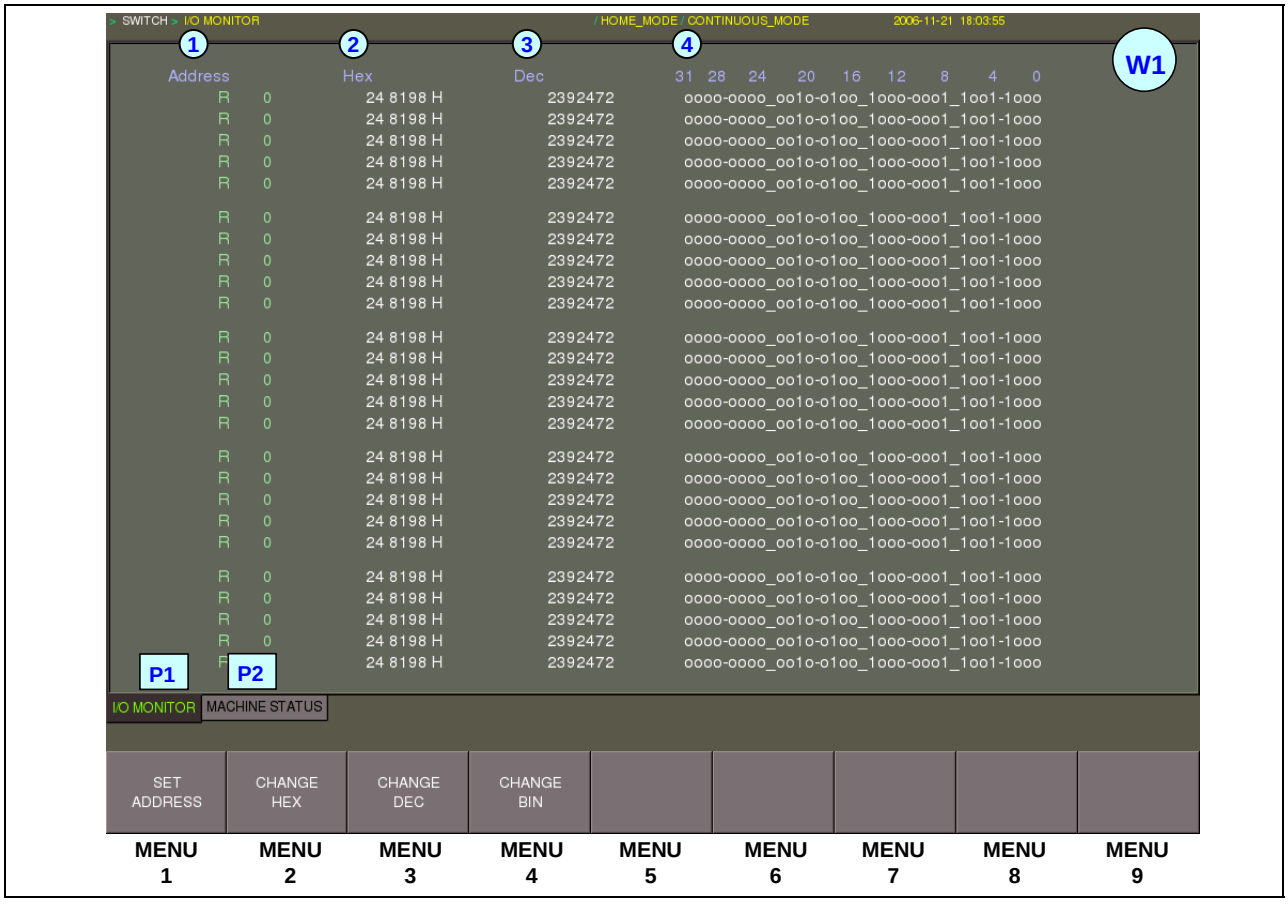


Fig. 2-28 **I/O MONITOR (I/O MONITOR)** screen

Screen display

Win-Page	Item	Description
W1-P1	I/O MONITOR	I/O monitor display
W1-P2	MACHINE STATUS	Remote I/O and DNC I/O status display

Display items

No.	Data Name	Display Range	Unit		Description
1	Address	0 - 999	-		I/O address
2	Hex	0 - FFFFFFFF	hex		Display of the data in hexadecimal
3	Dec	±2147483647	dec		Display of the data in decimal
4	Binary	0/1	bin		Display of the data in binary

Menu description

Menu	Item	Description
1	SET ADDRESS	The command for setting an address
2	CHANGE HEX	The command for setting the parameter at the cursor line in hexadecimal
3	CHANGE DEC	The command for setting the parameter at the cursor line in decimal
4	CHANGE BIN	The command for setting the parameter at the cursor line in binary
5		
6		
7		
8		
9		

2. MACHINE STATUS page

Fig. 2-29 **I/O MONITOR (MACHINE STATUS)** screen

Screen display

No.	Data Name	Display Range	Unit		Description
1	REMOTE I/O STATUS	-	-		Displays the remote I/O status and the number of error occurrences
2	DNC COMM. STATUS	-	-		Monitors the communication data and communication commands of DNC I/O.

Menu description

Menu	Item	Description
1		
2		
3		
4		
5		
6		
7		
8		
9	CLEAR RIO ERR	The command for clearing the remote I/O error occurrence time data

2-6-20 VERSION screen

1. CNC page

The screen allows you to confirm the software versions. (The example below shows the screen of the HG series.)

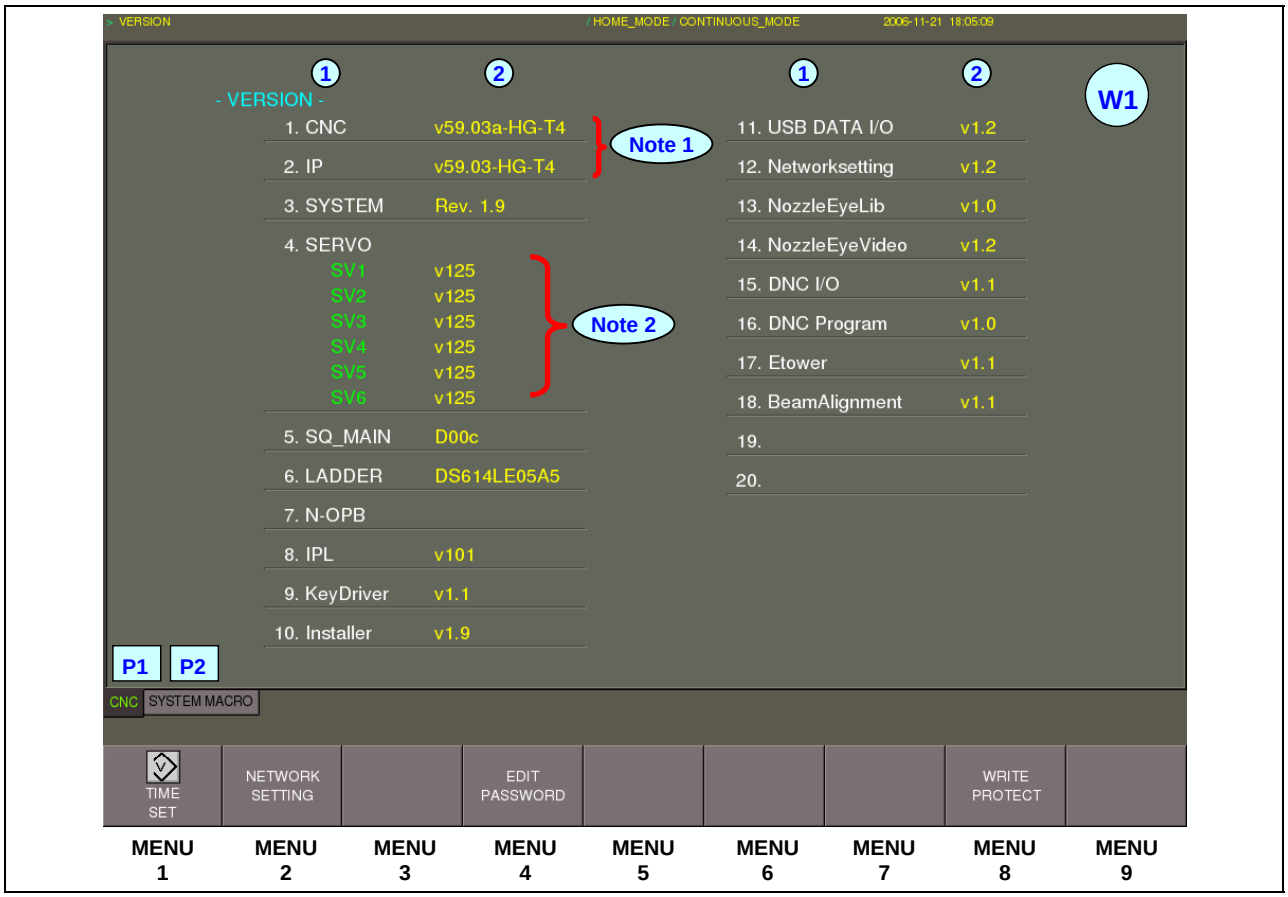


Fig. 2-30 **VERSION (CNC)** screen

Screen display

Win-Page	Item	Description
W1-P1	CNC	CNC software version
W1-P2	SYSTEM MACRO	System macro version

Screen display

No.	Data Name	Description
1	Software	Name of software
2	Version	Version of software (Version differs depending on the supported machine models.) **Note 1:** With the STX series, “-STX” is suffixed to the version name. With the HG series, “-HG-Tn” is suffixed to the version name (n: number of torches). With the HTX series, “-HTX” is suffixed to the version name. **Note 2:** With the STX series, servo version display is up to “-SV4”. With the HG series, servo version display is up to “-SV6”. With the HTX series, servo version display is up to “-SV4”.

Menu description

Menu	Item	Description
1	TIME SET	The command for setting a clock displayed at the upper right area of the screen
2	NETWORK SETTING	The command for setting the IP address and domain DHCP of the network
3		
4	EDIT PASSWORD	The command for changing the write-protection password
5		
6		
7		
8	WRITE PROTECT	The command for setting the write-protection using a password
9		

2. SYSTEM MACRO page

The system macro version can be confirmed.
(The example below shows the screen of the HG series.)

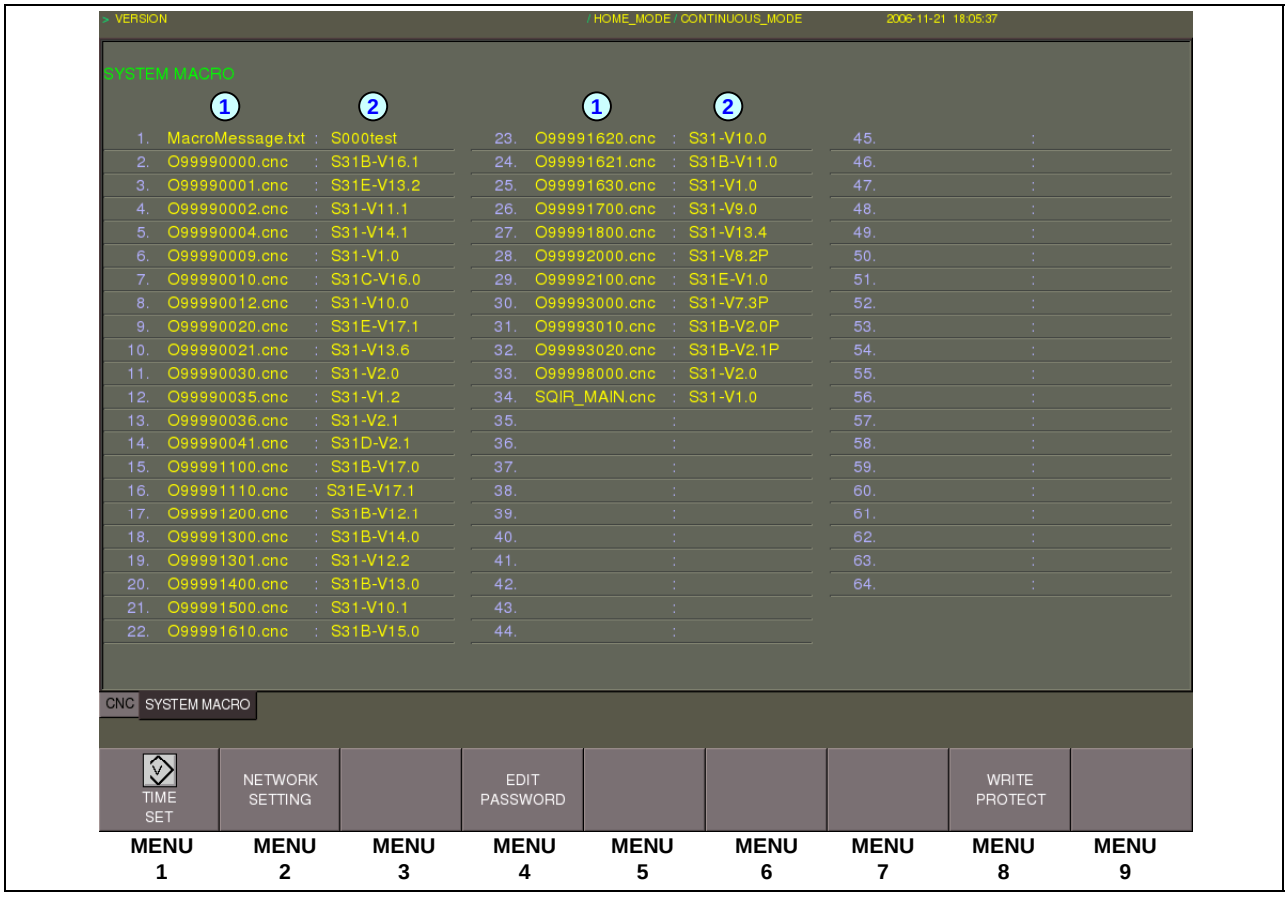


Fig. 2-31 **VERSION (SYSTEM MACRO)** screen

Screen display

No.	Data Name	Description
1	Program	System macro program name
2	Version	Version

Note: System macro program number and version name differ depending on the supported machine model.

Menu description

Menu	Item	Description
1	TIME SET	The command for setting a clock displayed at the upper right area of the screen
2	NETWORK SETTING	The command for setting the IP address and domain DHCP of the network
3		
4	EDIT PASSWORD	The command for changing the write-protection password
5		
6		
7		
8	WRITE PROTECT	The command for setting the write-protection using a password
9		

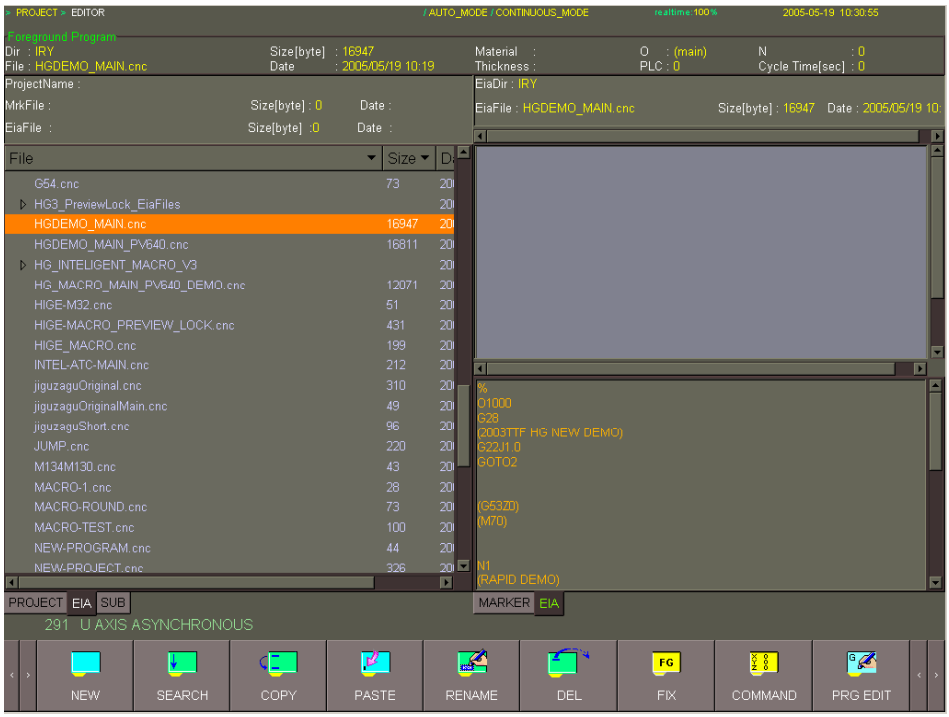
3 SCREEN OPERATRION

3-1 Creating a New Program

3-1-1 Creating a new EIA program

(1) Press the [PROGRAM] key on the operating panel.

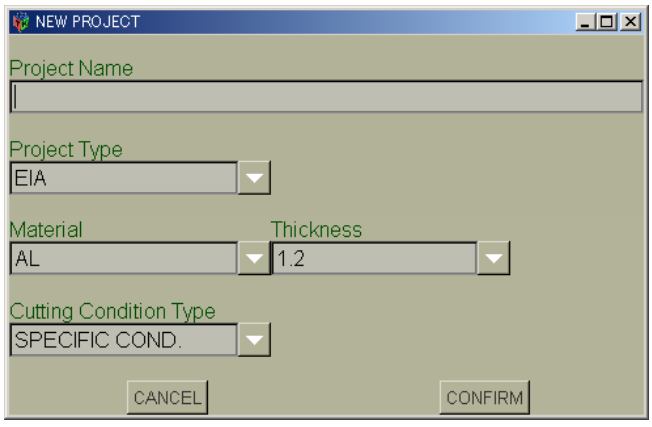
➔ The **PROJECT** screen will be displayed.



(2) Press the **[NEW]** menu key.

➔ The **NEW PROJECT** window will open.

Note: You can call up the same screen by pressing the **[NEW]** menu key in the **EDITOR** screen.



(3) Enter the file name in the **Project Name** filed.

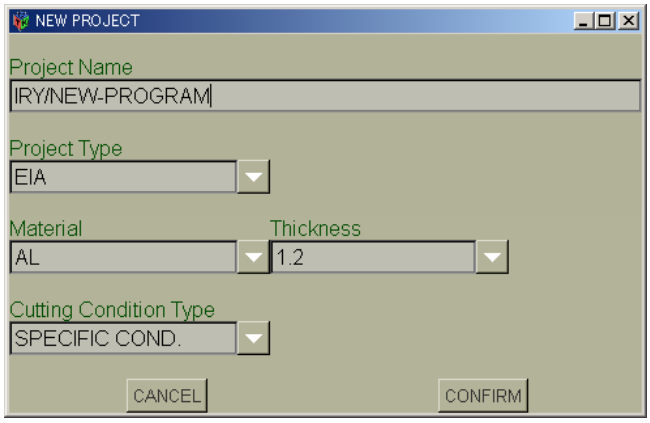
Entry of an extension is not required. If you want to make the file in the required folder, enter the folder name and the file name with a slash in between as “folder name / file name”.

(4) Press the [TAB] key.

➔ The cursor moves to the **Project Type** field.

(5) Select “EIA” by pressing the [↑] and [↓] keys.

- In EIA programming, it is not necessary to set **Material**, **Thickness** and **Cutting Condition Type** data.



(6) Press the [TAB] key to select the **[CONFIRM]** button.

(7) Press the [INPUT] key.

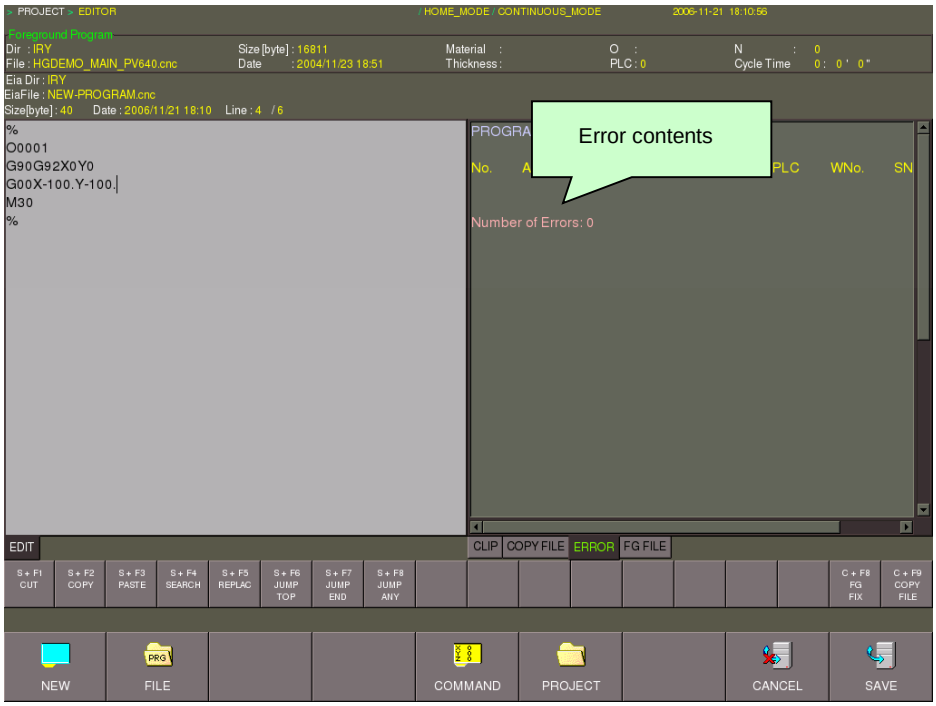
➔ The **EDITOR** screen will open to allow you to create a new program.

(8) Enter the program data using the alphanumeric keys on the operating panel.

(9) Press the **[SAVE]** menu key.

➔ The program is saved in the file.

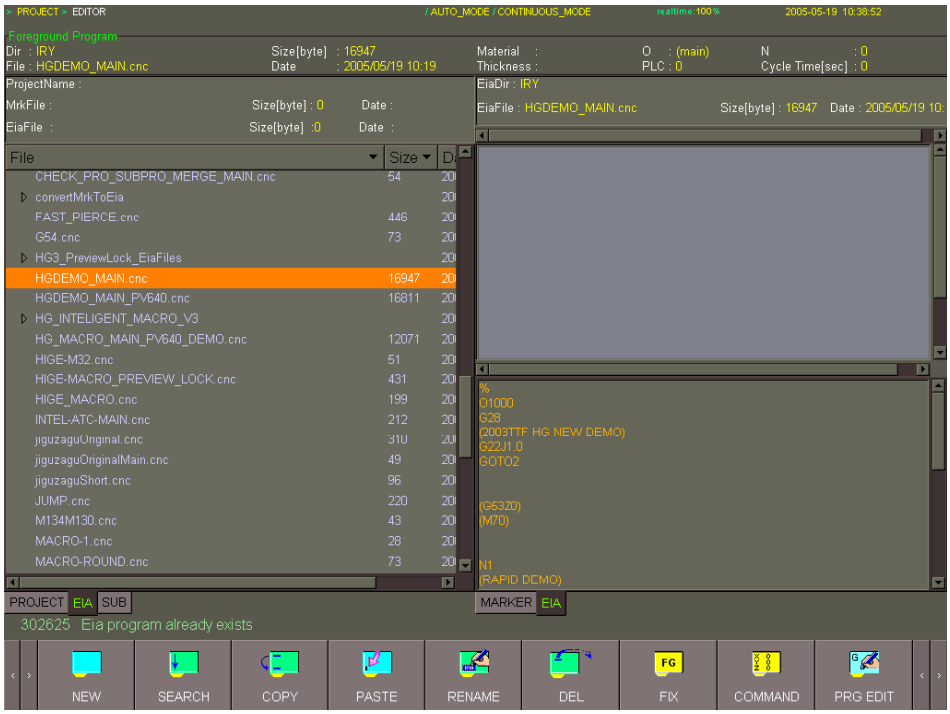
➔ If the program has a syntax error, details of the error are displayed on the **PROGRAM ERRORS** page.



3-2 Editing an Existing Program

(1) Press the [PROGRAM] key on the operating panel.

➔ The **PROJECT** screen will be displayed.



(2) Select the program you want to edit by pressing the [↑] and [↓] keys.

- To open the folder:

  Click ▶ by mouse, or

  Press the [Shift] + [+] keys at the same time.

- To close the folder:

  Click ▶ by mouse, or

  Press the [Shift] + [–] keys at the same time.

(3) Press the **[PRG EDIT]** menu key.

➔ The **EDITOR** screen will be displayed with the selected program displayed on it.

- You can call up the same screen by pressing the **[FILE]** menu key in the **EDITOR** screen.

(4) Press the [↓] key.

➔ The cursor will appear.

(5) Edit the program using the alphanumeric keys on the operating panel.

(6) Press the **[SAVE]** menu key.

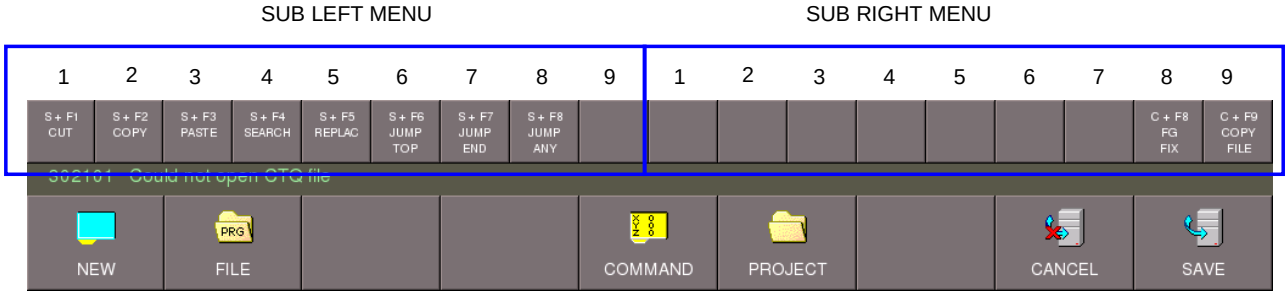
➔ The program is saved in the file.

➔ If the program has a syntax error, details of the error are displayed on the **PROGRAM ERRORS** page.

- If you press the **[CANCEL]** menu key, the contents of saved file are read out again. This menu can be conveniently used to go back to the original program.

3-3 Using the Program Editing Function

Basically, alphanumeric keys are used when you edit a program. In addition to this, the CNC has the functions specially used for editing a program efficiently.



SUB LEFT MENU

Menu	Item	Description
1	CUT	The command for cutting the program data
2	COPY	The command for copying the program data
3	PASTE	The command for pasting the program data
4	SEARCH	The command for searching for the character string of the program data (Search is possible only for a character string in a single line.)
5	REPLAC	The command for replacing the character string of the program data (Replace is possible only for a character string in a single line.)
6	JUMP TOP	The command for jump to the first line of the program
7	JUMP END	The command for jump to the last line of the program
8	JUMP ANY	The command for jump to the specified line of the program
9		

- Select by pressing [Shift] + **[Menu]** keys.

SUB RIGHT MENU

Menu	Item	Description
1		
2		
3		
4		
5		
6		
7		
8	FG FIX	The command for selecting the currently edited program as the foreground program
9	COPY FILE	Display of a program other than the program currently edited (Allows copying of data of other programs.)

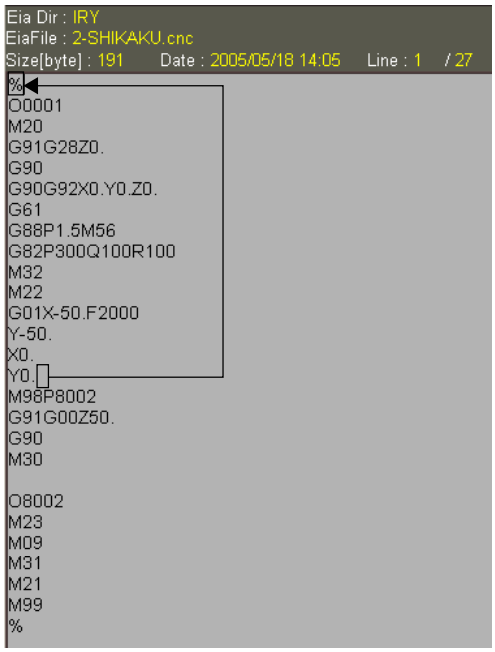
- Select by pressing [Ctrl] + **[Menu]** keys.

3-3-1 Moving the cursor (jump)

1. Moving the cursor to the first line in the program

(1) Press the **[JUMP TOP]** menu key.

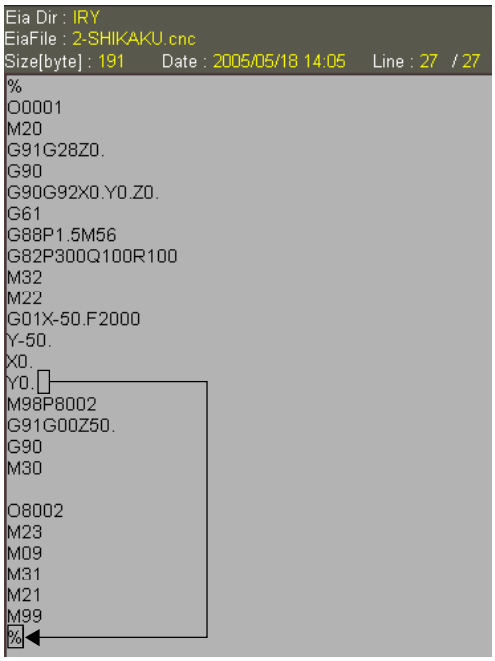
➔ The cursor moves to the first line in the program.



2. Moving the cursor to the end of the program

(1) Press the **[JUMP END]** menu key.

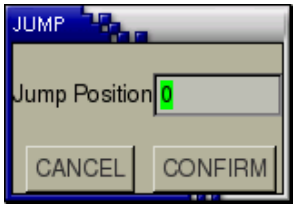
➔ The cursor moves to the last line in the program.



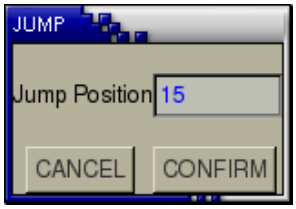
3. Moving the cursor to the desired position

(1) Press the **[JUMP ANY]** menu key.

➔ The **JUMP** popup window will open.

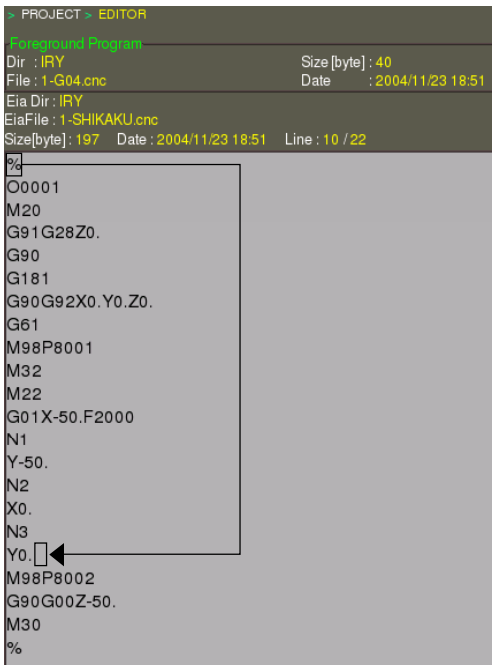


(2) Enter the line number of the desired jump position.



(3) Press the **[CONFIRM]** button.

➔ The cursor moves to the specified line.

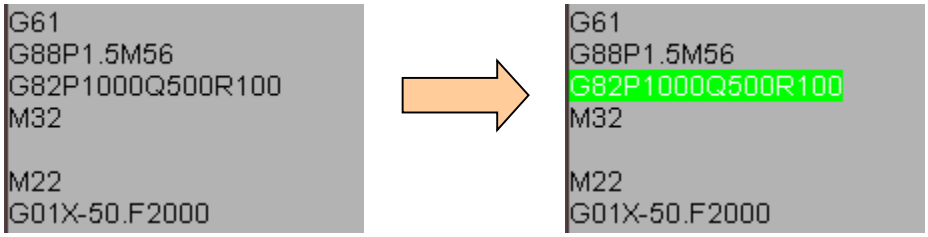


3-3-2 Copying character strings (copy & paste)

You can copy the selected character strings to the desired position in the program.

(1) Select the character strings you want to copy using the mouse.

➔ The selected character strings will be highlighted.

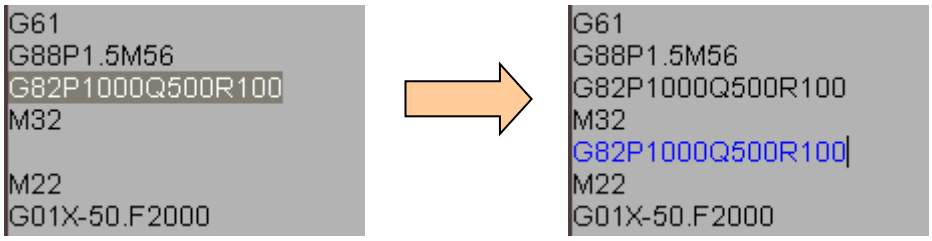


(2) Press the **[COPY]** menu key.

(3) Move the cursor to the position where you want to copy the selected character strings.

(4) Press the **[PASTE]** menu key.

➔ The selected character strings are copied.

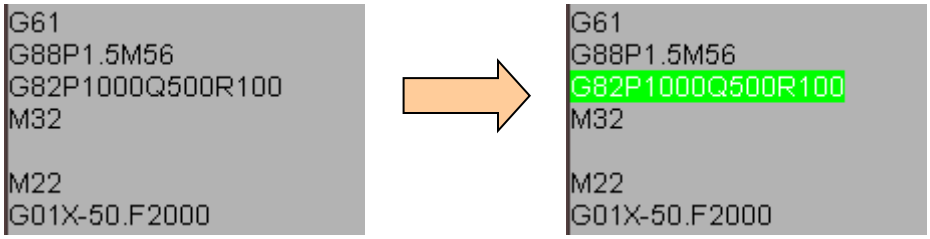


3-3-3 Moving character strings (cut & paste)

You can move the selected character strings to the desired position in the program.

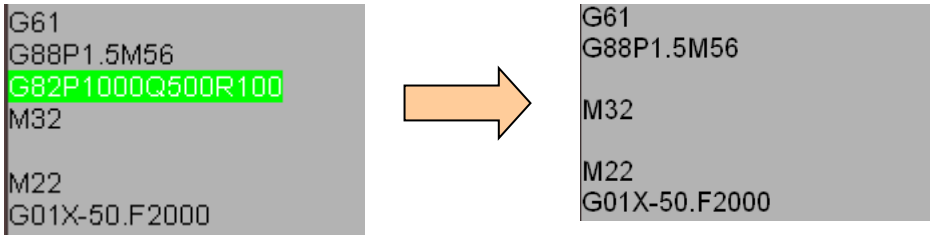
(1) Select the character strings you want to copy using the mouse.

➔ The selected character strings will be highlighted.



(2) Press the **[CUT]** menu key.

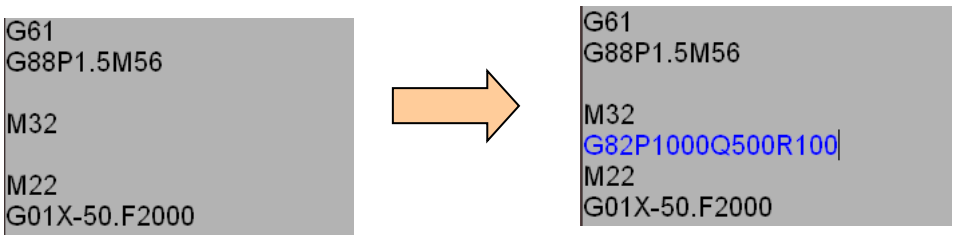
➔ The selected character strings will be cut.



(3) Move the cursor to the position where you want to copy the selected character strings.

(4) Press the **[PASTE]** menu key.

➔ The selected character strings will be moved.



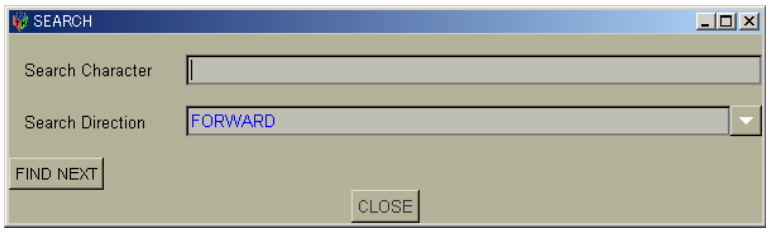
3-3-4 Searching for character strings

Using the search function, you can search for a desired character string in a program.

Search can be done forward or backward from the current cursor position.

(1) Press the **[SEARCH]** menu key.

➔ The **SEARCH** popup window will open.



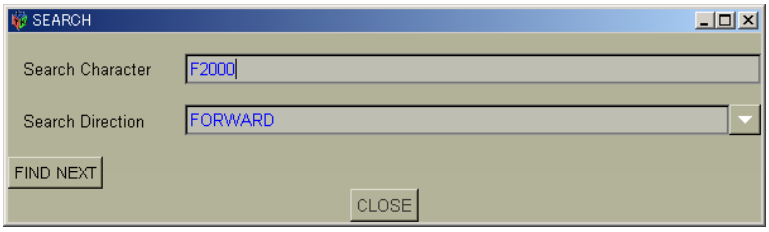
(2) Enter the character string you want to search for in the **Search Character** field.

Example: F2000

(3) Press the [TAB] key to move the cursor to the **Search Direction** field.

(4) Select the search direction by pressing the [↑] and [↓] keys.

Example: FORWARD



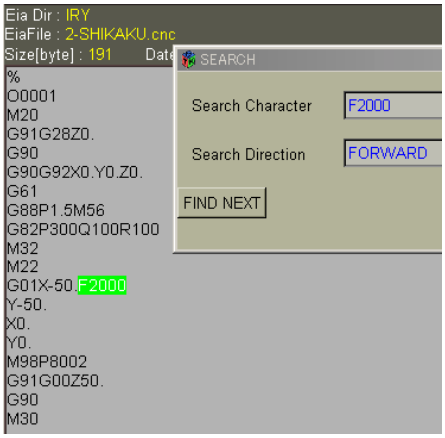
(5) Press the [TAB] key.

➔ This selects the **[FIND NEXT]** button.

(6) Press the [INPUT] key.

➔ This starts search and the found character string is highlighted.

Press the **[FIND NEXT]** button to continue searching.



- When the specified character string is not found, the operation ends in error. In this case, the cursor does not move.

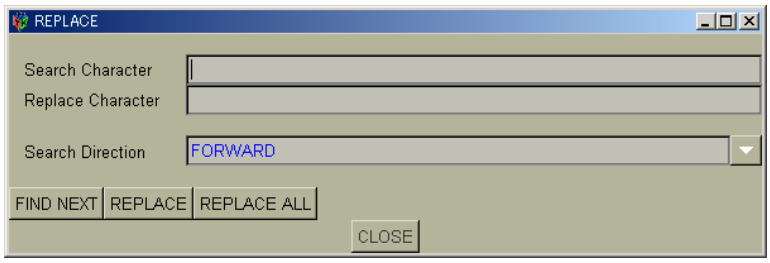
3-3-5 Replacing character strings

Using the replace function, you can replace the specified character string to the desired one.

Search and replace can be done forward or backward from the current cursor position.

(1) Press the **[REPLAC]** menu key.

➔ The **REPLACE** popup window will open.



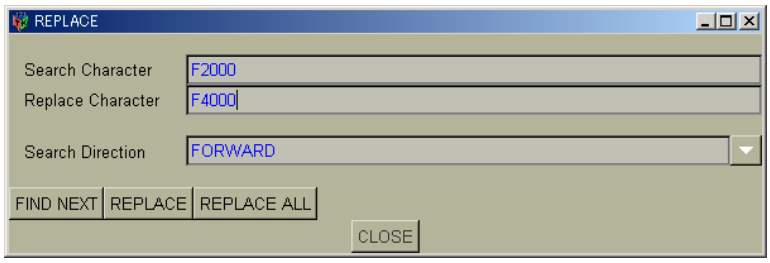
(2) Enter the character string you want to search for in the **Search Character** field.

Example: F2000

(3) Press the [TAB] key to move the cursor to the **Replace Character** field.

(4) Enter the character string to which you want to replace in the **Replace Character** field.

Example: F4000



(5) Press the [TAB] key to move the cursor to the **Search Direction** field.

(6) Select the search direction by pressing the [↑] and [↓] keys.

Example: FORWARD

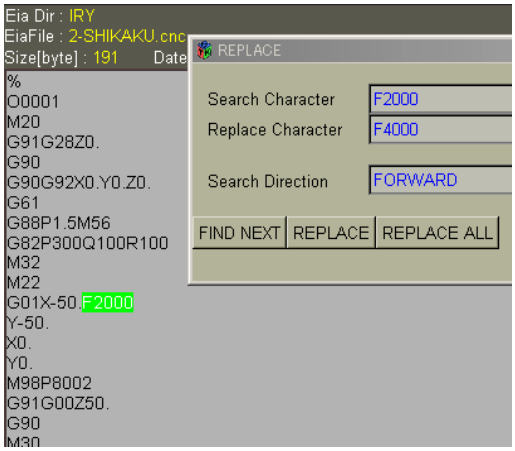
(7) Determine the replacement method.

1. To replace one by one
2. To replace all in one time

To replace one by one:

(8) Press the **[FIND NEXT]** button and press the [INPUT] key.

➔ This starts search and the found character string is highlighted.



(9) Press the [TAB] key to select the **[REPLACE]** button and press the [INPUT] key.

➔ The character string is replaced and the search for the next character string starts.

Example: F2000 is replaced by F4000.

- When the specified character string is not found, the operation ends in error. In this case, the cursor does not move.

To replace all in one time:

(8) Press the **[REPLACE ALL]** button and press the [INPUT] key.

➔ This starts search and the search target character strings are all replaced with the specified character string at a time.

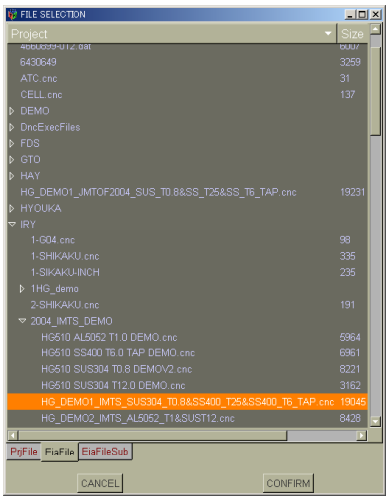
➔ Finally, the message of **No more searching character string** is displayed indicating the completion of replacement.

3-3-6 Copying from other program

It is possible to copy character strings from other program.

(1) Press the **[COPY FILE]** menu key.

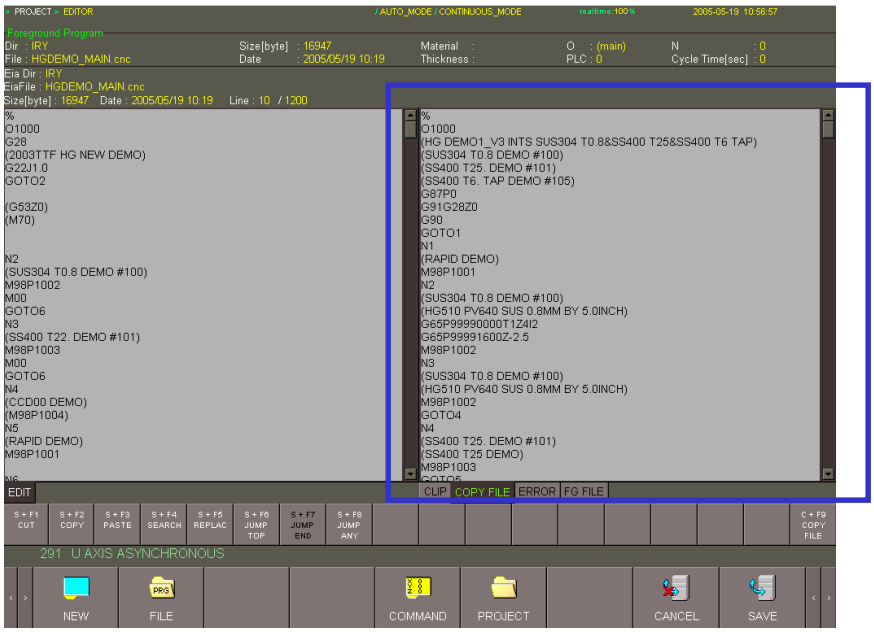
➔ The **FILE SELECTION** popup window will open.



(2) Select the program file you want to open by pressing the [↓] key.

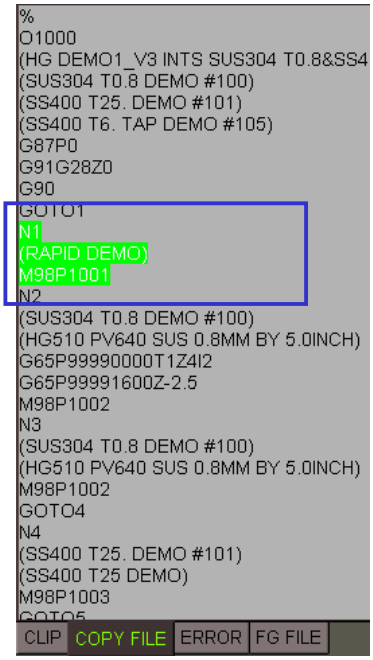
(3) Press the [TAB] key to select the **[CONFIRM]** button and then press the [INPUT] key.

➔ The selected program is displayed in the **COPY FILE** page on the right side of the **EDITOR** screen.



(4) Move the cursor to the first line of the character strings you want to copy by pressing the [↓] key.

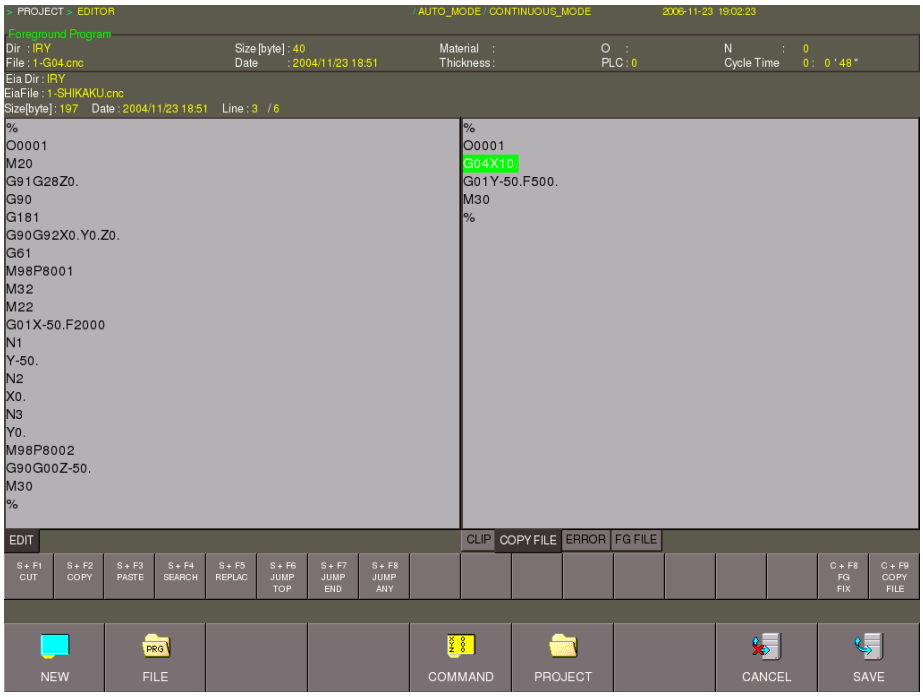
(5) Select the character strings to be copied by pressing the [Shift] + [→] keys.



(6) Press the **[COPY]** menu key.

➔ The specified character strings are copied to the temporary memory area.

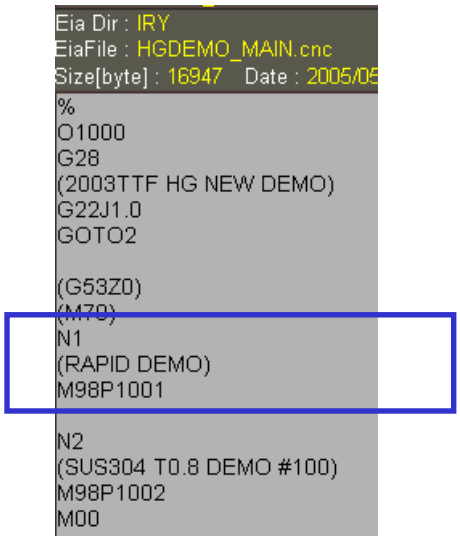
(7) Press the window selection key to move back to the **EDIT** page on the left side of the **EDITOR** screen.



(8) Move the cursor to the copy target position by pressing the [↑] and [↓] keys.

(9) Press the **[PASTE]** menu key.

➔ The character strings, having been copied to the temporary memory area, are inserted to the cursor located position.



3-4 Operating Program Files

Open the **PROJECT** screen. From this screen you can operate a program file.

(1) Press the [PROGRAM] key on the operating panel.

➔ The **PROJECT** screen will be displayed.

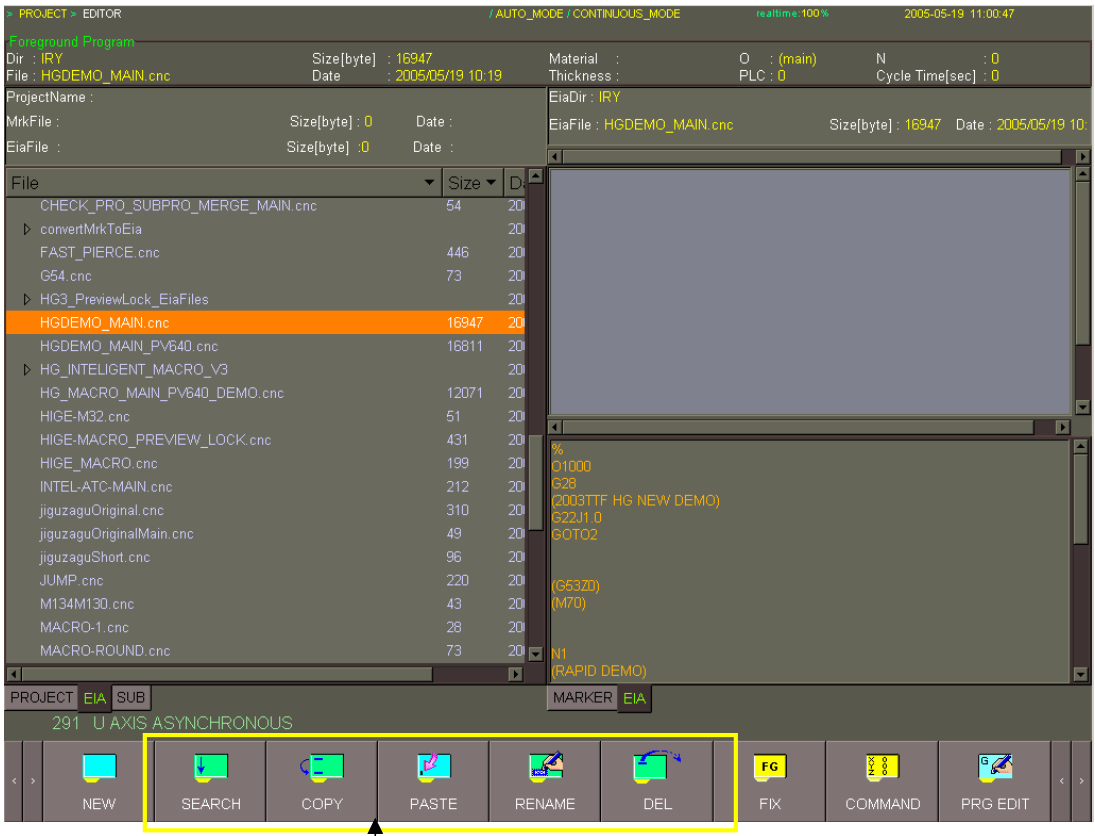


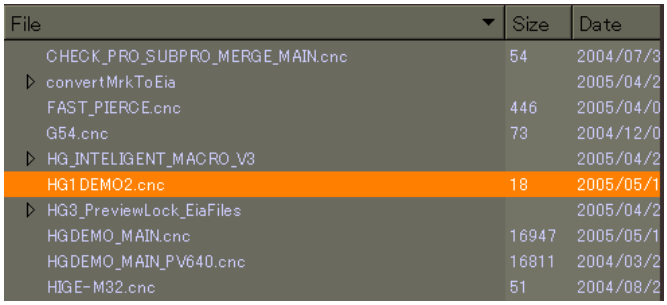
Fig. 3-1

3-4-1 Copying a program file

You can copy an existing program file.

(1) Select the program file you want to copy by pressing the [↓] key.

Example: HG1DEMO2.cnc



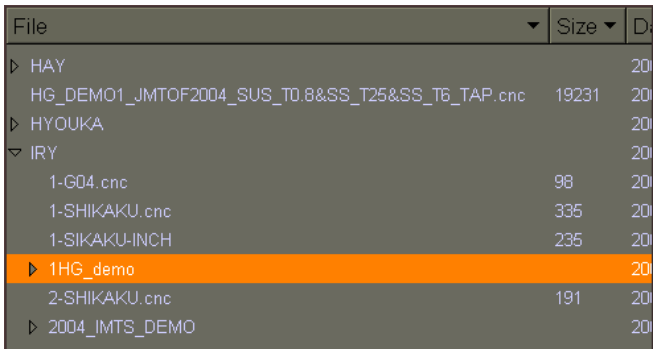
- To open the folder, press the [Ctrl] + [+] keys.

(2) Press the **[COPY]** menu key.

(3) Select the copy destination folder by the cursor. Selection of the same folder is allowed.

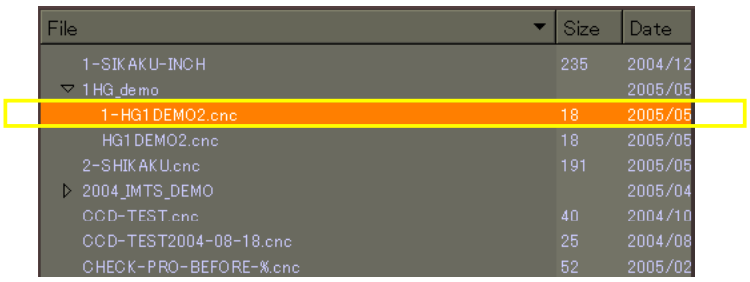
If the copy destination folder is not selected, the program file is copied to the root.

Example: 1_HG_demo



(4) Press the **[PASTE]** menu key.

➔ The selected program file is copied to the selected folder.



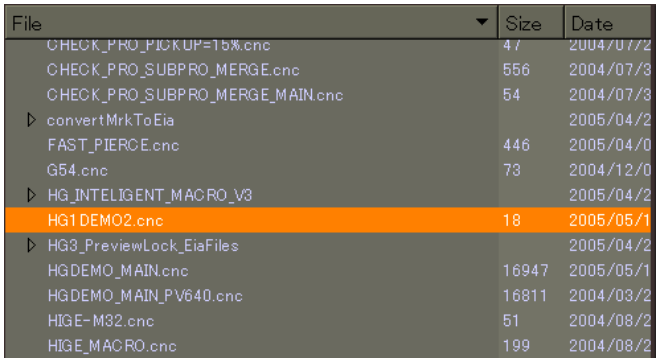
- When the same file name exists in the copy destination folder, the file name of the program to be copied is automatically changed. A prefix “1-” is attached to the file name.

3-4-2 Deleting a program file

You can delete an existing program file.

(1) Select the program file you want to delete by pressing the [↓] key.

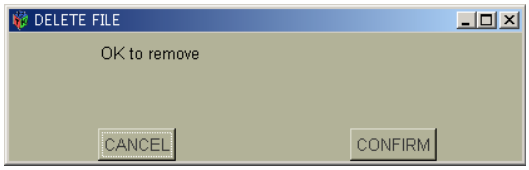
Example: HG1DEMO2.cnc



- To open the folder, press the [Ctrl] + [+] keys.

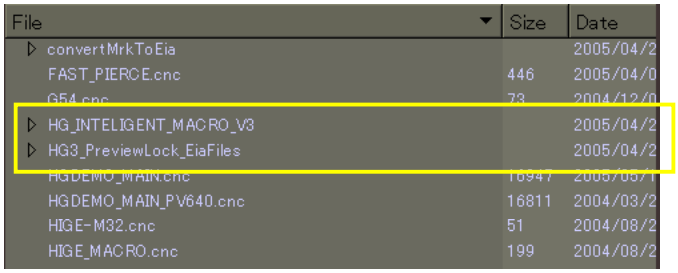
(2) Press the **[DEL]** menu key.

➔ The confirmation message window will open.



(3) Press the [TAB] key to select the **[CONFIRM]** button and then press the [INPUT] key.

➔ The selected file is deleted.



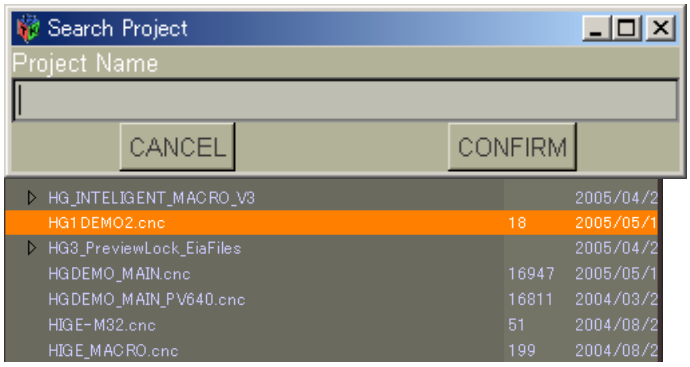
3-4-3 Searching for a program file

You can search an existing program file.

Example: 1HG_demo / O9060.cnc

(1) Press the **[SEARCH]** menu key.

➔ The **Search Project** popup window will open.



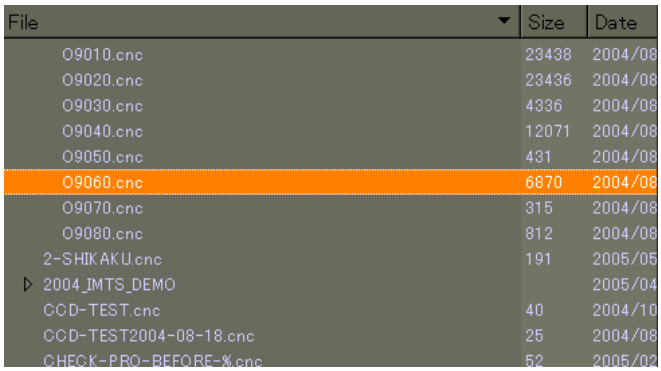
(2) Enter the search target program file name.

Example: O9060.cnc

Note: Make sure to enter extension ".cnc".

(3) Press the [TAB] key to select the **[CONFIRM]** button and then press the [INPUT] key.

➔ Search for the specified file, O9060.cnc, starts and the cursor moves to the found file.



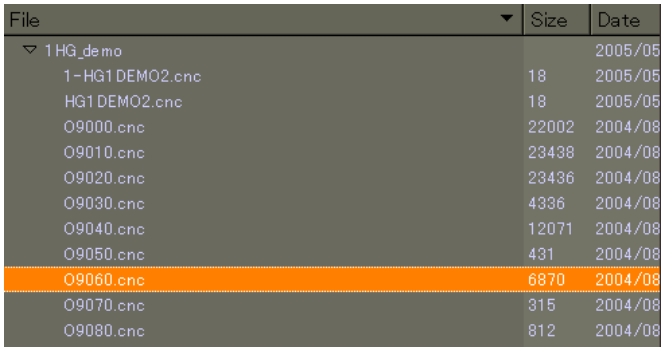
3-4-4 Renaming a program file

You can change the name of an existing program file.

Example: Changing the program file name 1HG_demo / O9060.cnc

(1) Select the program file you want to rename by pressing the [↓] key.

Example: O9060.cnc



(2) Press the **[RENAME]** menu key.

➔ The **RENAME FILE** popup window will open.

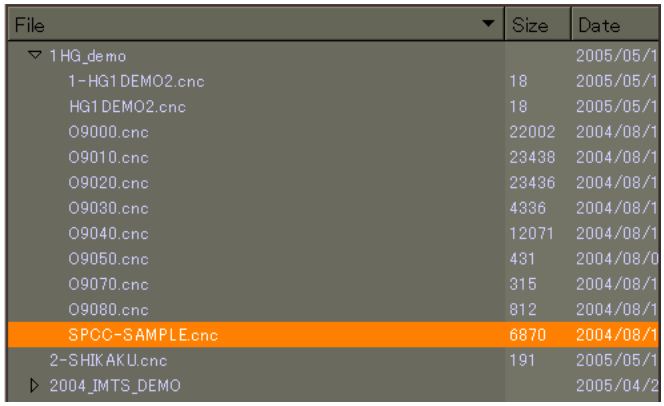
(3) Enter the new file name.

Example: SPCC-SAMPLE.cnc

Note: Make sure to enter extension ".cnc".

(4) Press the [TAB] key to select the **[CONFIRM]** button and then press the [INPUT] key.

➔ File name "O9060.cnc" is changed to "SPCC-SAMPLE.cnc".

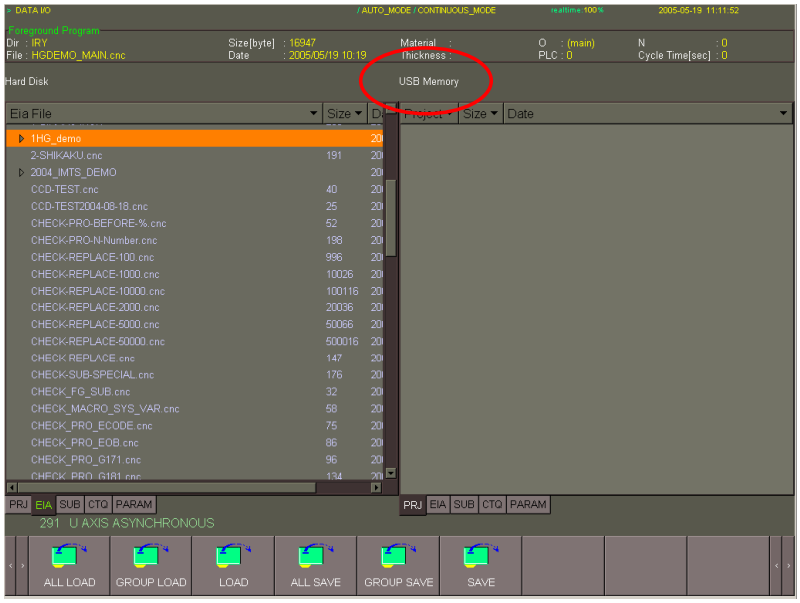


3-5 Inputting/Outputting Program Files

You can load and save a program between an external memory device (USB memory device) and the CNC using the **DATA I/O** screen.

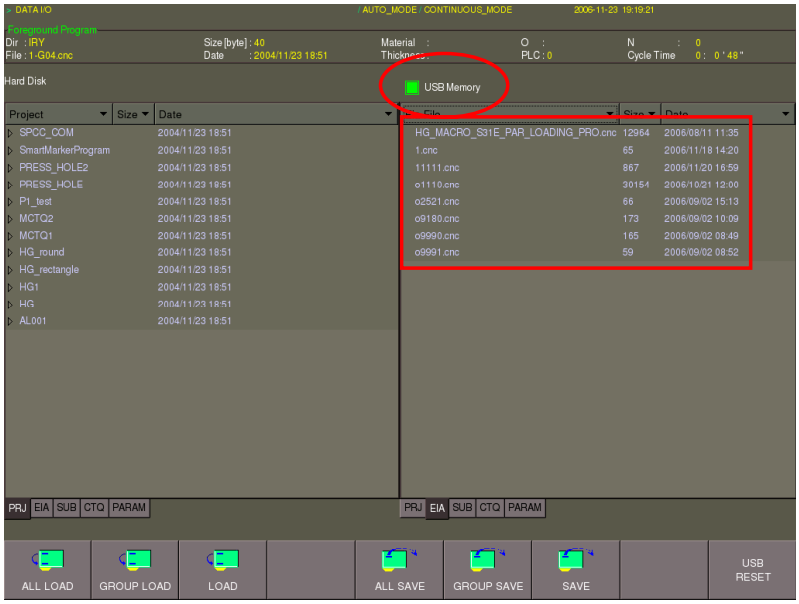
(1) Press the [DATA I/O] key on the operating panel.

➔ The **DATA I/O** screen will be displayed.



(2) Set the USB memory device to the CNC.

➔ When the USB memory device is detected, the USB memory device detection icon is displayed on the screen together with the programs.

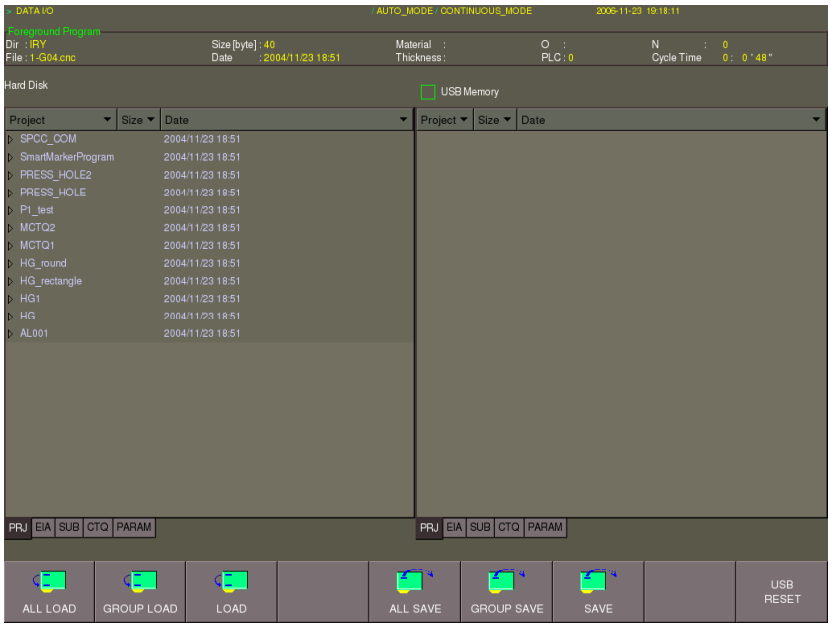


3-5-1 Reading individual programs and parameters from USB to CNC (load)

You can load CNC programs and parameters from the USB memory device to the CNC.

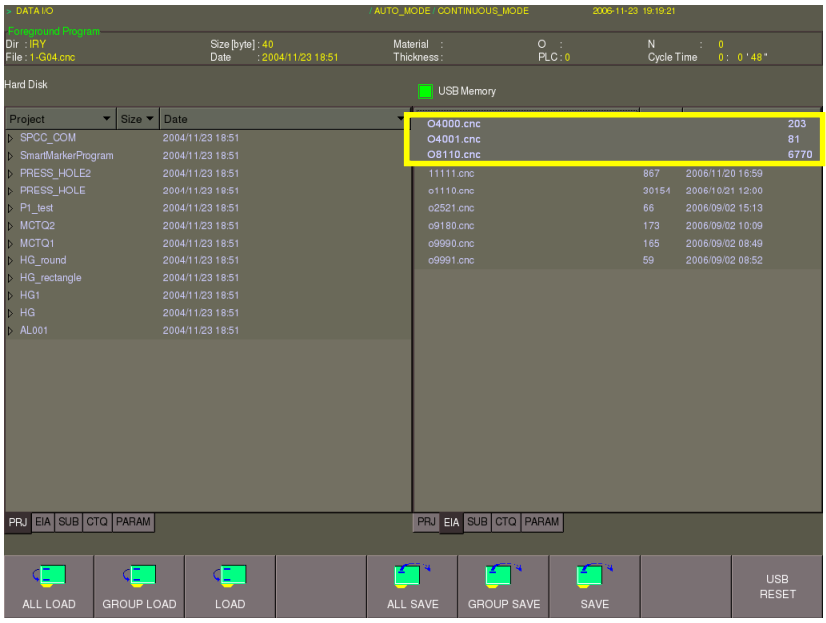
(1) Press the [DATA I/O] key on the operating panel.

➔ The **DATA I/O** screen will be displayed.



(2) Insert the USB memory device into the USB port at the right side of the operating panel.

➔ The device is automatically detected and the contents of the device are displayed on the right side of the **DATA I/O** screen.

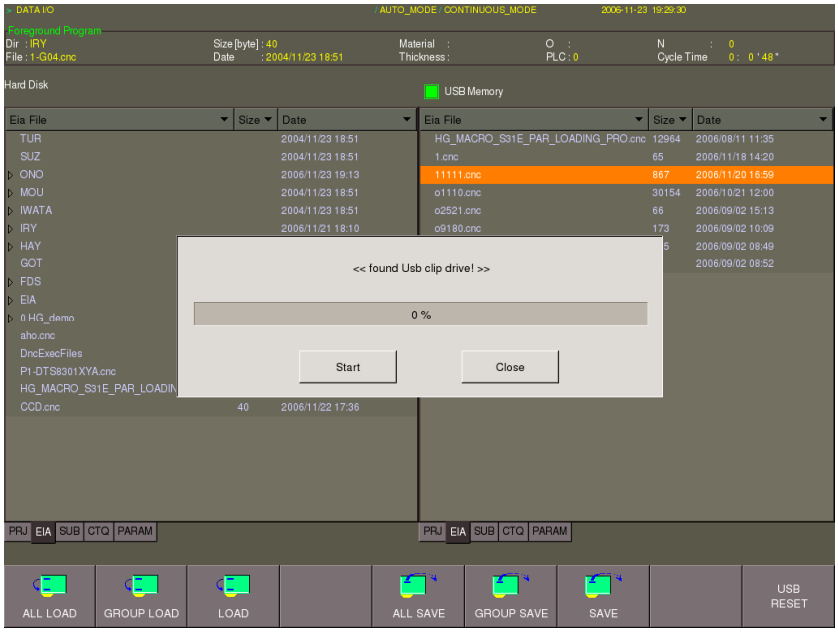


(3) Select the program file you want to load to the CNC in the list of program files displayed on the right side of the screen.

Example: 11111.cnc

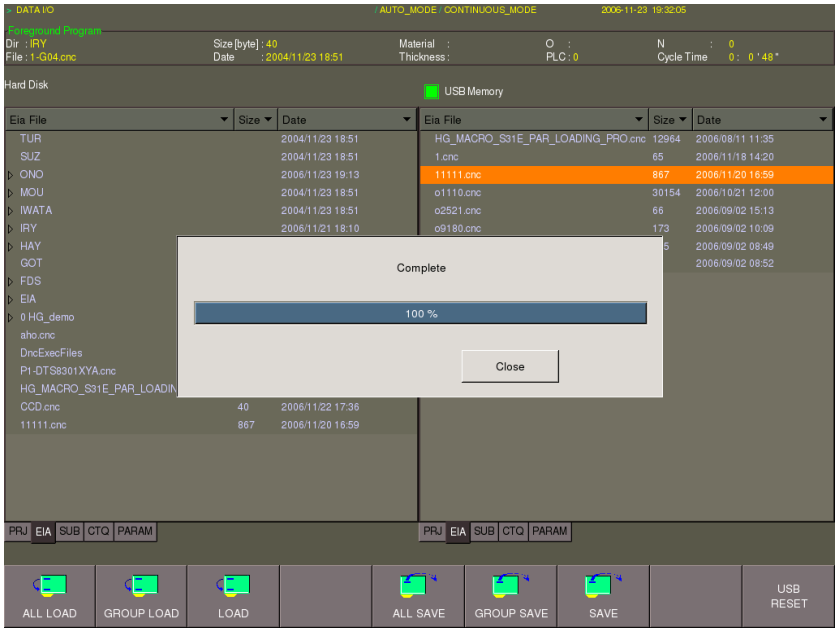
(4) Press the **[LOAD]** menu key.

➔ The dialog box as shown below is displayed.



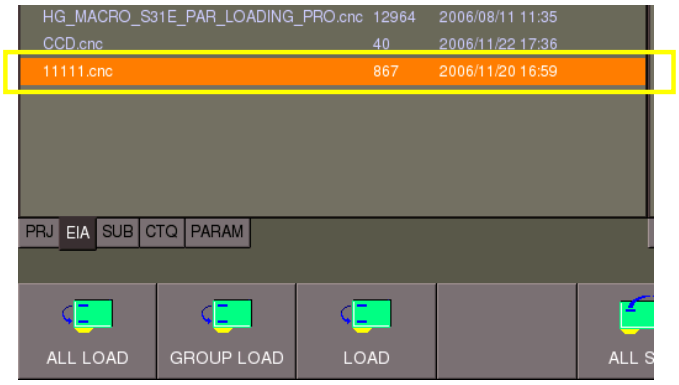
(5) Click the **[Start]** button.

➔ The progress bar reaches 100% and the message **Complete** is displayed.



(6) Click the **[Close]** button.

➔ Example: The file name of the loaded program file, 11111.cnc in this case, is displayed on the left side of the **DATA I/O** screen (**CNC** screen).



3-5-2 Reading programs and parameters from USB to CNC in a group (group load)

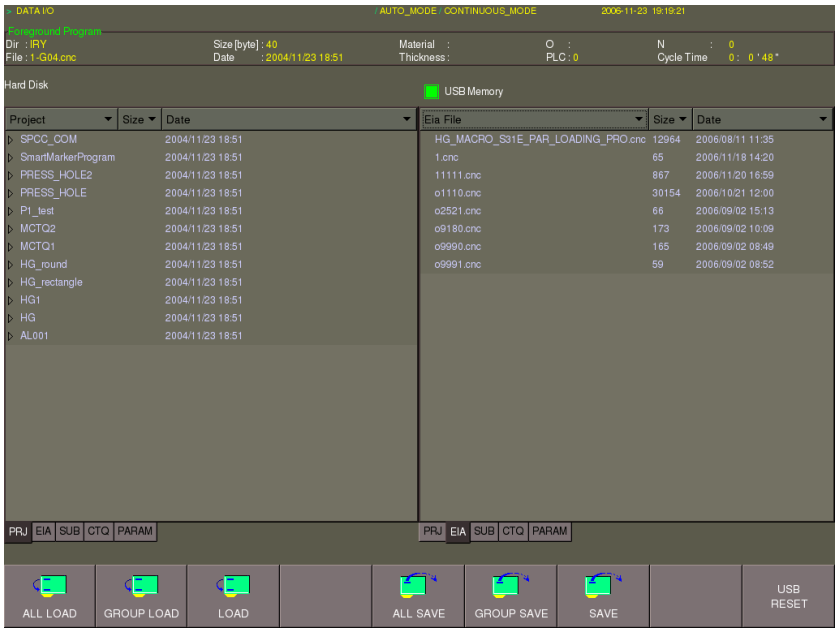
You can load CNC program files or data files from the USB memory device to the CNC.

(1) Press the [DATA I/O] key on the operating panel.

➔ The **DATA I/O** screen will be displayed.

(2) Insert the USB memory device into the USB port at the right side of the operating panel.

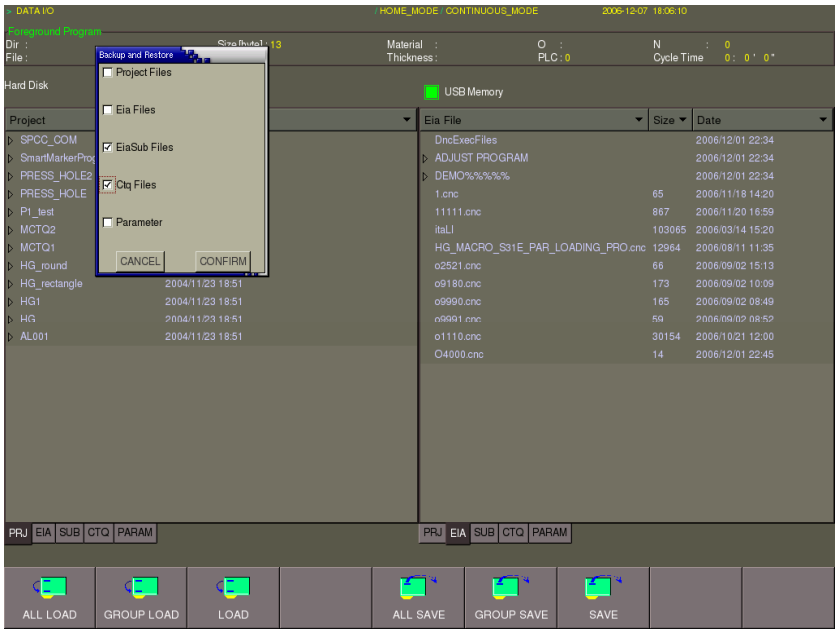
➔ The device is automatically detected and the contents of the device are displayed on the right side of the **DATA I/O** screen.



(3) Press the **[GROUP LOAD]** menu key.

➔ The dialog box as shown below is displayed.

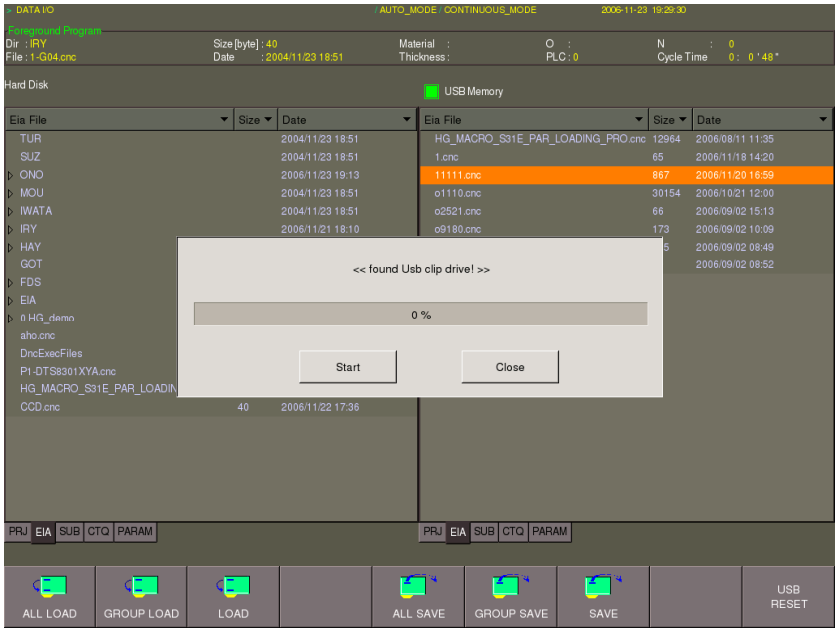
(4) Check the data you want to load.



Example: EIA subprogram (**EiaSub Files**) and Cutting technique file (**Ctq Files**)

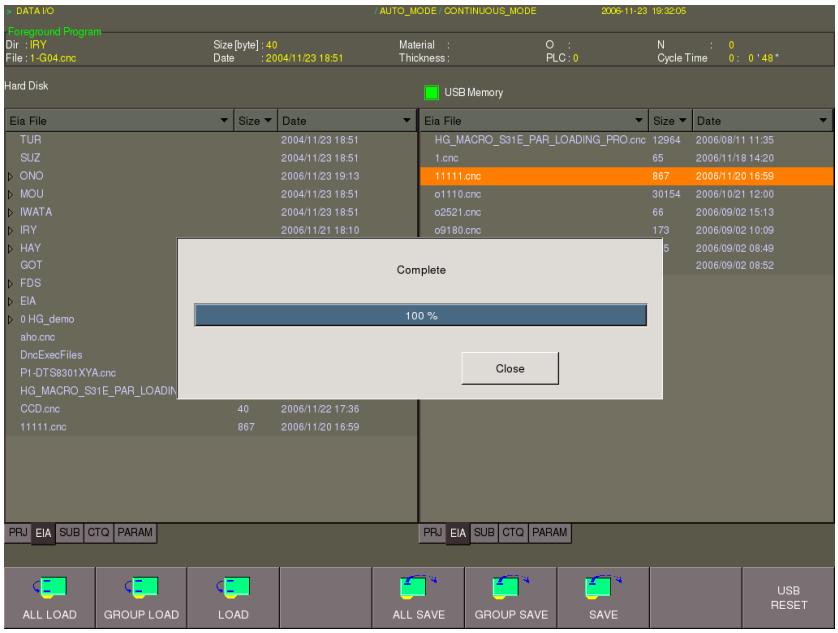
(5) Click the **[CONFIRM]** button.

➔ The dialog box as shown below is displayed.



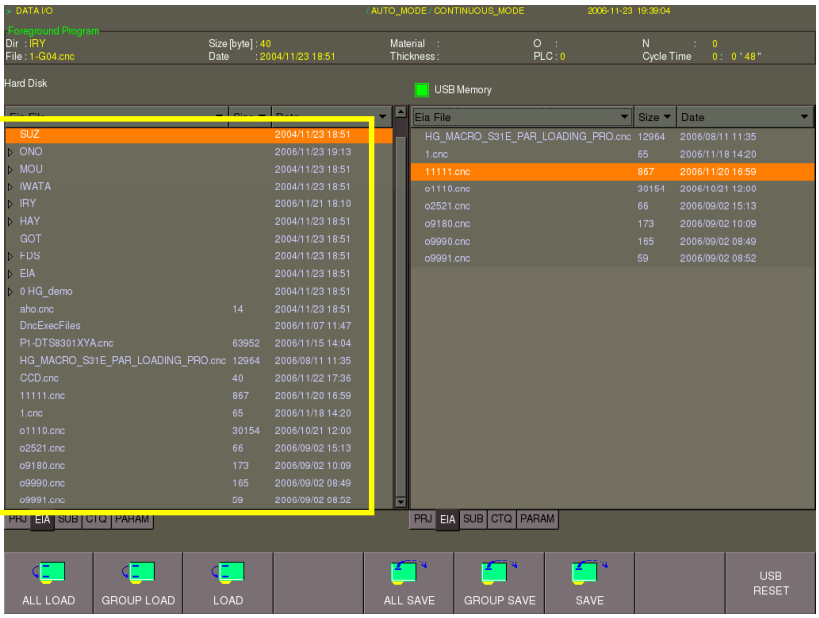
(6) Click the **[Start]** button.

➔ The progress bar reaches 100% and the message **Complete** is displayed.



(7) Click the **[Close]** button.

(8) Confirm that the data has been loaded.



3-5-3 Reading all program files from USB to CNC (all load)

You can read all program files from USB memory device to the CNC.

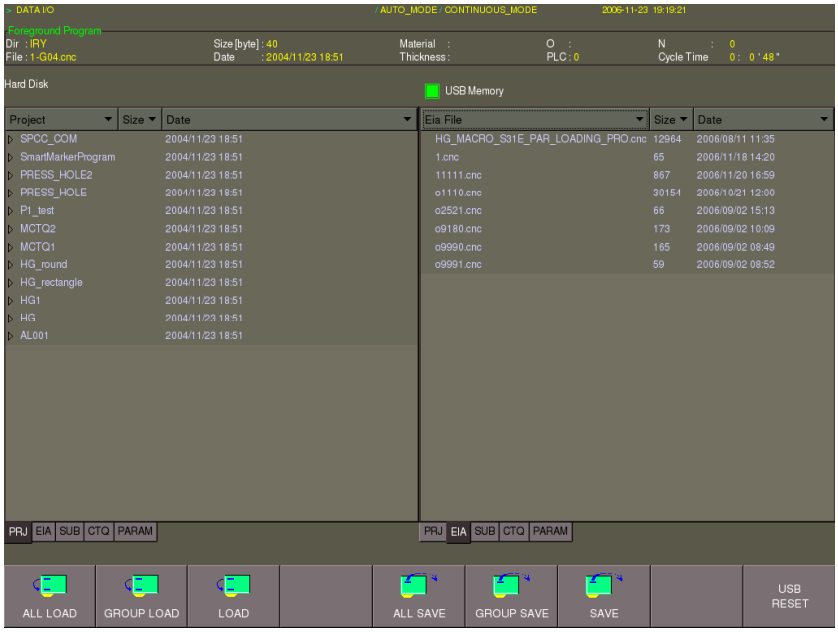
(Data that can be loaded using the ALL LOAD command: All project files, all EIA programs and all EIA subprograms)

(1) Press the [DATA I/O] key on the operating panel.

➔ The **DATA I/O** screen will be displayed.

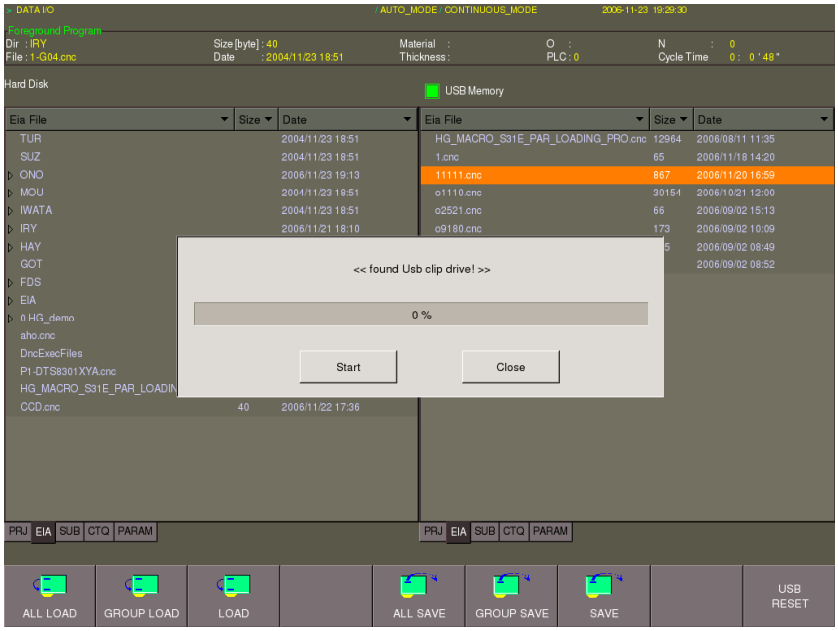
(2) Insert the USB memory device into the USB port at the right side of the operating panel.

➔ The device is automatically detected and the contents of the device are displayed on the right side of the **DATA I/O** screen.



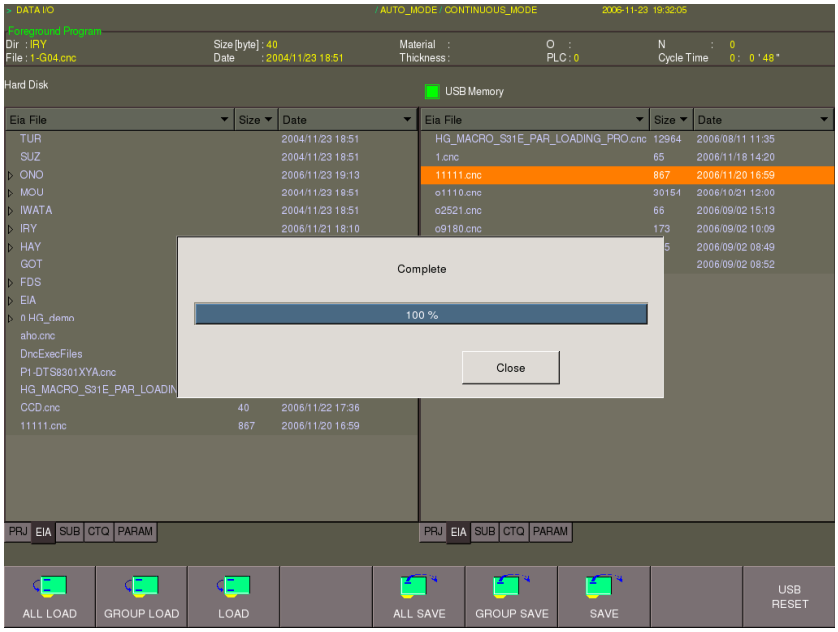
(3) Press the **[ALL LOAD]** menu key.

➔ The dialog box as shown below is displayed.



(4) Click the **[Start]** button.

➔ The progress bar reaches 100% and the message **Complete** is displayed.



(5) Click the **[Close]** button.

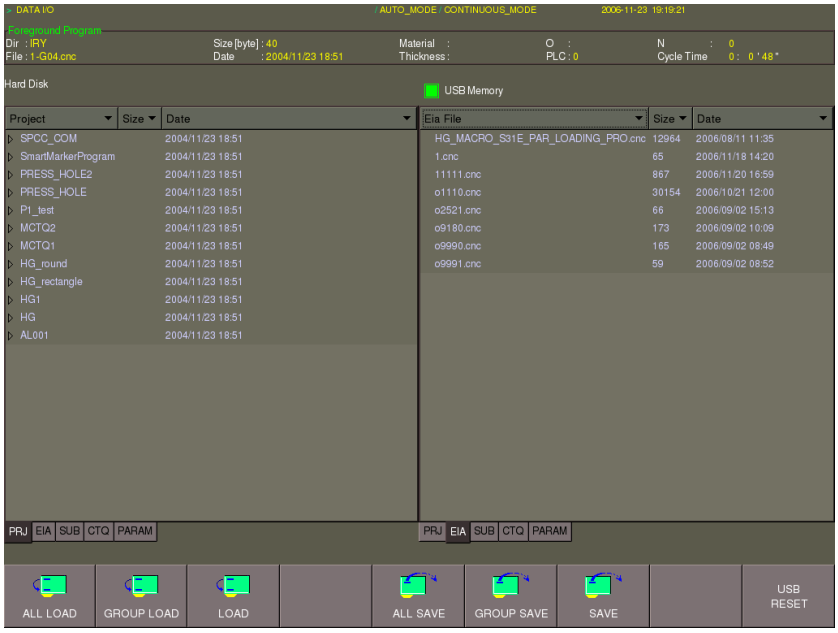
(6) Display the project screen and confirm that the programs have been loaded.

3-5-4 Saving individual programs and parameters from CNC to USB (save)

You can save a program file in the CNC to the USB memory device.

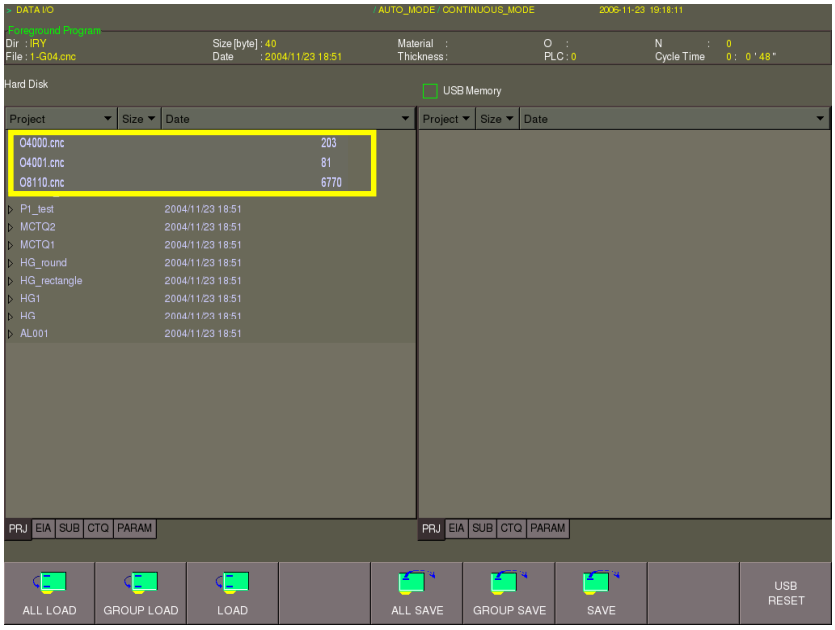
(1) Press the [DATA I/O] key on the operating panel.

➔ The **DATA I/O** screen will be displayed.



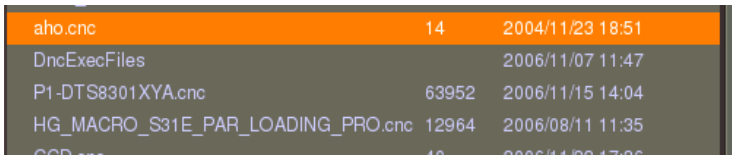
(2) Insert the USB memory device into the USB port at the right side of the operating panel.

➔ The device is automatically detected and the contents of the device are displayed on the right side of the **DATA I/O** screen.



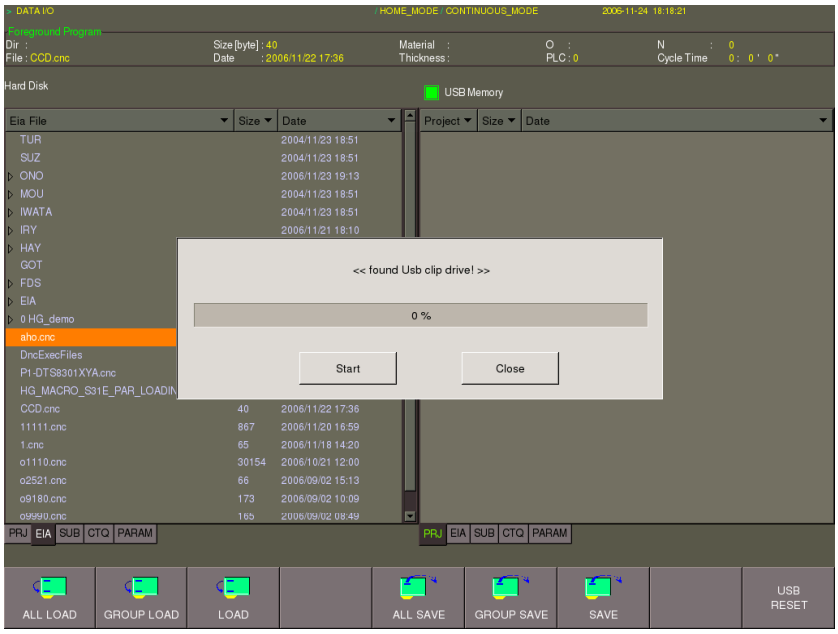
(3) Select the program file you want to save to the USB memory device in the list of CNC program files displayed on the left side of the screen.

Example: aho.cnc



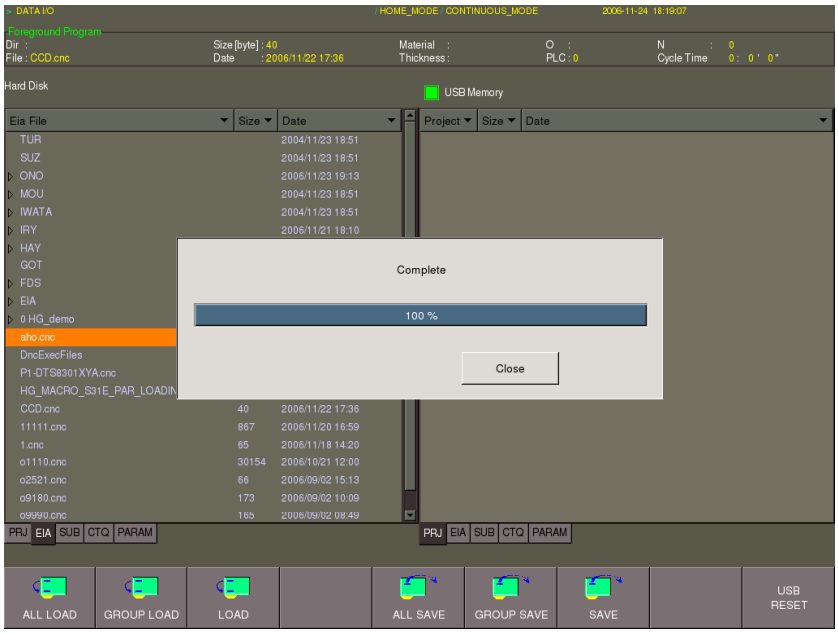
(4) Press the **[SAVE]** menu key.

➔ The dialog box as shown below is displayed.



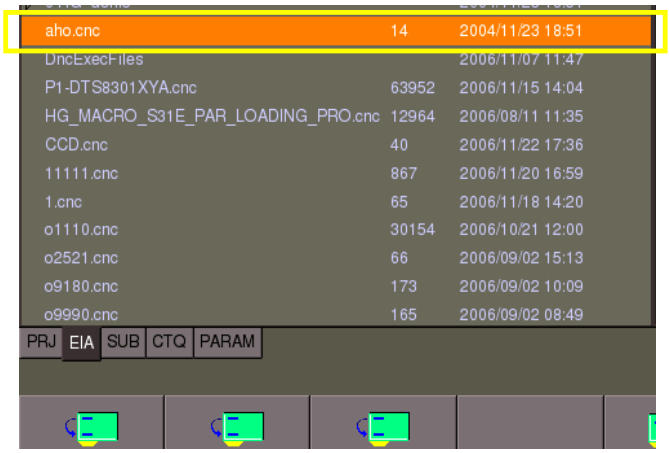
(5) Click the **[Start]** button.

➔ The progress bar reaches 100% and the message **Complete** is displayed.



(6) Click the **[Close]** button.

Example: The file name of the program file saved to the USB memory device, aho.cnc in this case, is displayed on the right side of the **DATA I/O** screen (**USB** screen).



3-5-5 Saving programs and parameters from CNC to USB in a group (group save)

You can save a program file or CNC data in the CNC to the USB memory device.

(1) Press the [DATA I/O] key on the operating panel.

➔ The **DATA I/O** screen will be displayed.

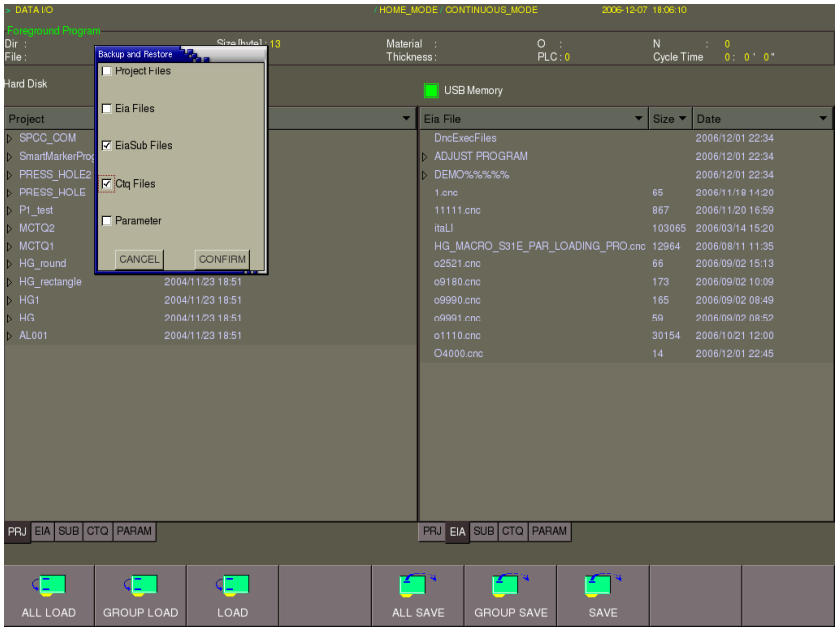
(2) Insert the USB memory device into the USB port at the right side of the operating panel.

➔ The device is automatically detected and the contents of the device are displayed on the right side of the **DATA I/O** screen.

(3) Press the **[GROUP SAVE]** menu key.

➔ The dialog box as shown below is displayed.

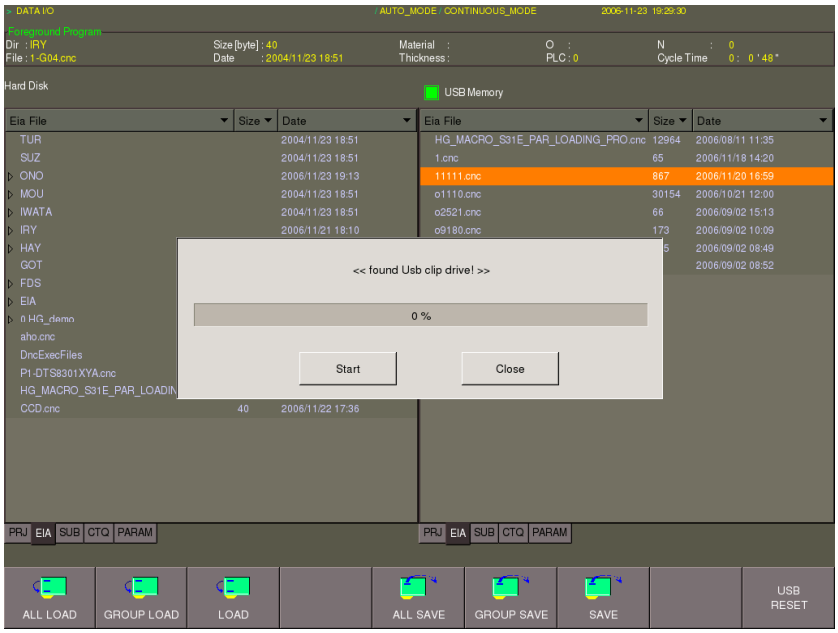
(4) Check the data you want to save.



Example: EIA subprogram (**EiaSub Files**) and Cutting technique file (**Ctq Files**)

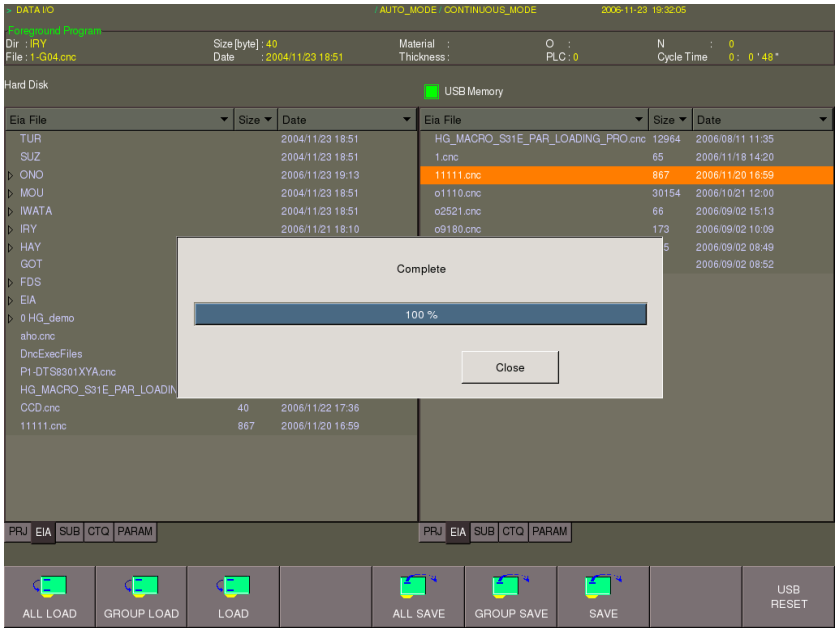
(5) Click the **[CONFIRM]** button.

➔ The dialog box as shown below is displayed.



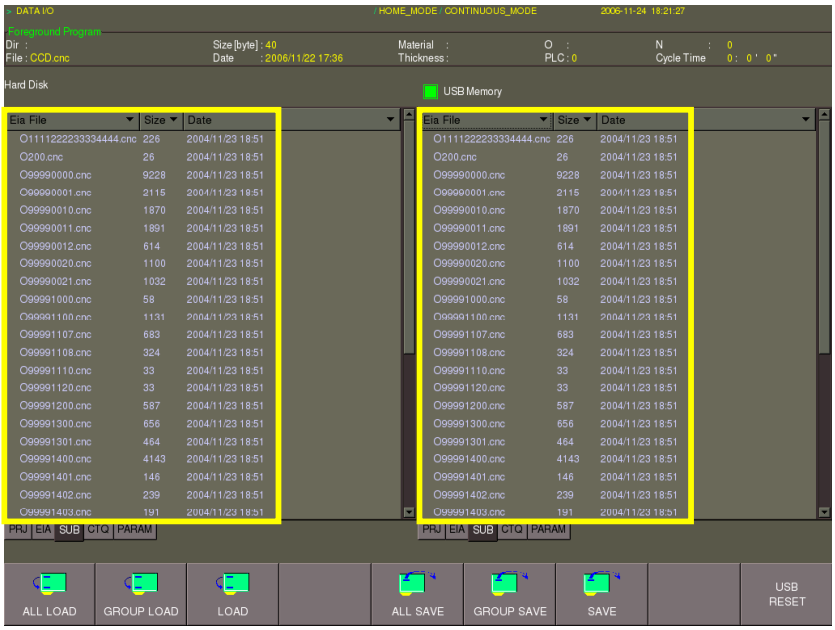
(6) Click the **[Start]** button.

➔ The progress bar reaches 100% and the message **Complete** is displayed.



(7) Click the **[Close]** button.

(8) Confirm that the data has been saved by checking the USB memory display at the right side.



3-5-6 Saving all program files from CNC to USB (all save)

You can save all program files in the CNC to the USB memory device

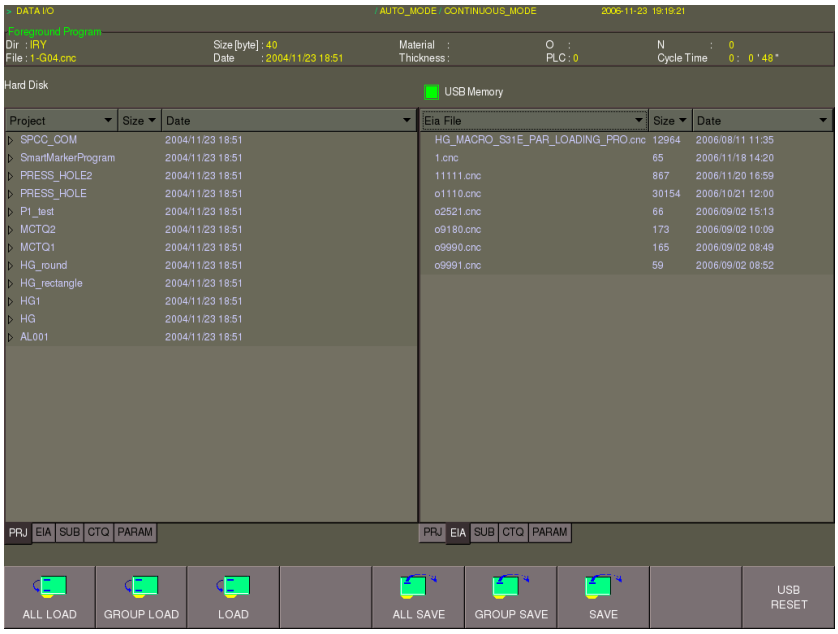
(Data that can be saved using the ALL SAVE command: All project files, all EIA programs and all EIA subprograms)

(1) Press the [DATA I/O] key on the operating panel.

➔ The **DATA I/O** screen will be displayed.

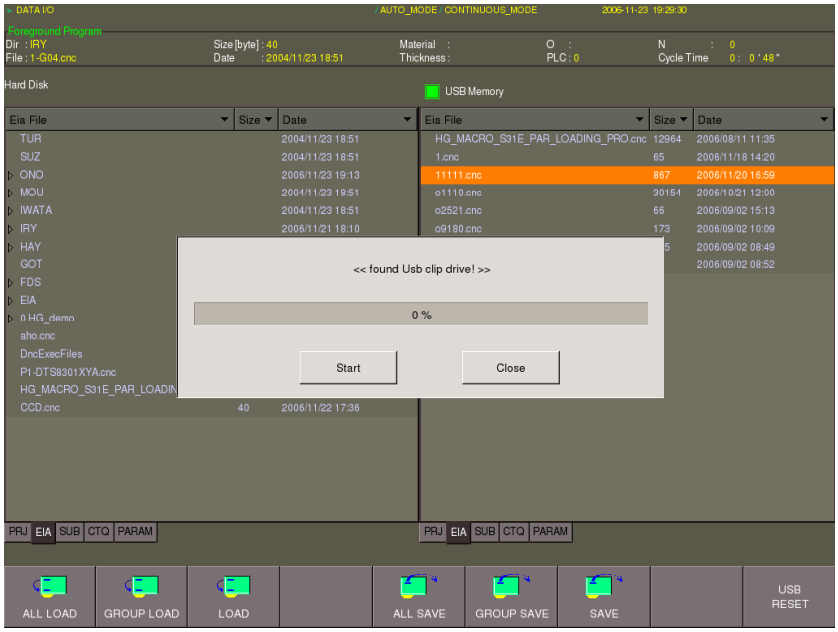
(2) Insert the USB memory device into the USB port at the right side of the operating panel.

➔ The device is automatically detected and the contents of the device are displayed on the right side of the **DATA I/O** screen.



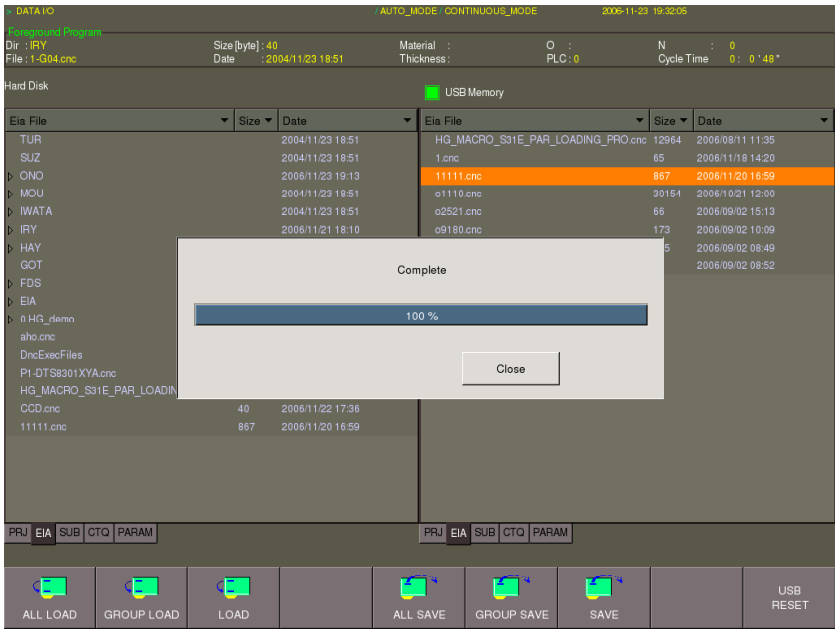
(3) Press the **[ALL SAVE]** menu key.

➔ The dialog box as shown below is displayed.



(4) Click the **[Start]** button.

➔ The progress bar reaches 100% and the message **Complete** is displayed.



(5) Click the **[Close]** button.

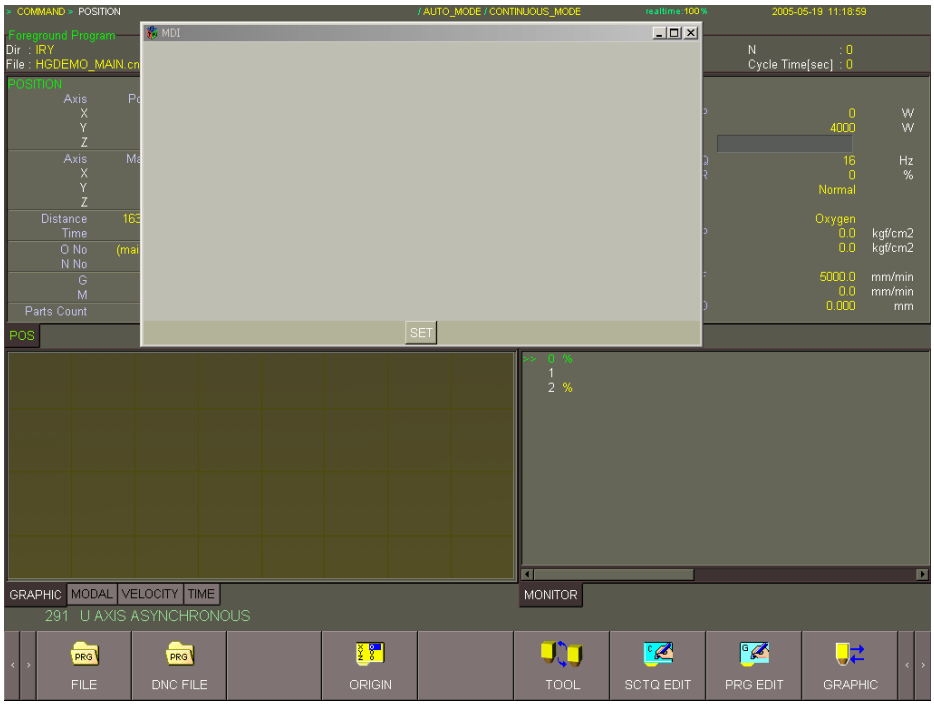
(6) Confirm that the programs have been saved by checking the USB memory display at the right side.

3-6 MDI Operation

MDI mode operation is convenient for executing a short program.

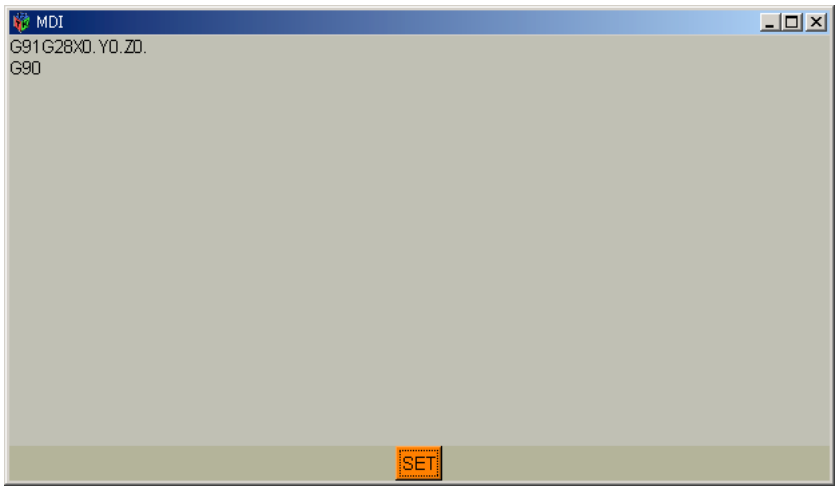
(1) Press the [MDI] mode selection key on the operating panel.

➔ The **MDI** popup window will open.



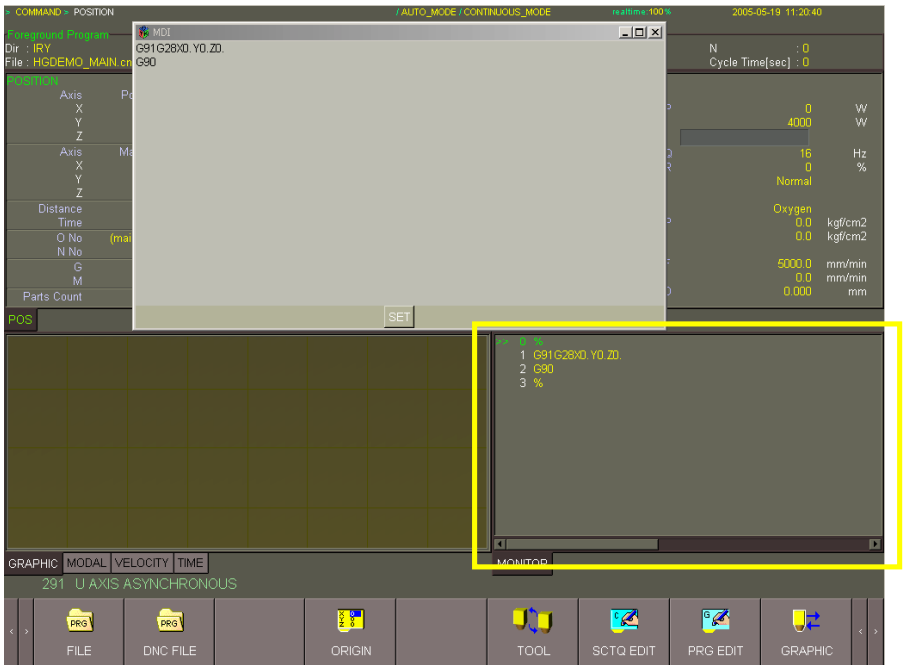
(2) Enter the program.

Example: Enter the “return to the origin” command.



(3) Press the **[SET]** button.

➔ The entered program is displayed in the **MONITOR** page.



(4) Press the [CYCLE START] button on the operating panel.
Before pressing the [CYCLE START] button, make sure to confirm that the entered program is correct.

➔ This executes the program.

Example: The machine moves to the origin.

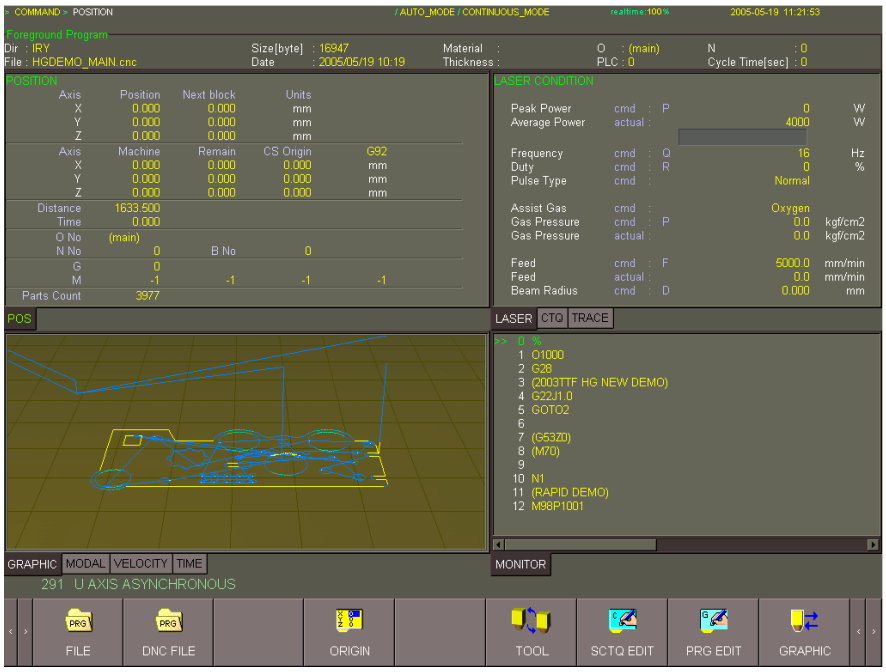
3-7 Automatic Operation

You can execute a program in the automatic operation mode by selecting the program in the **COMMAND** screen.

Before starting automatic operation, it is necessary to prepare the material, set the machine and the resonator ready for operation.

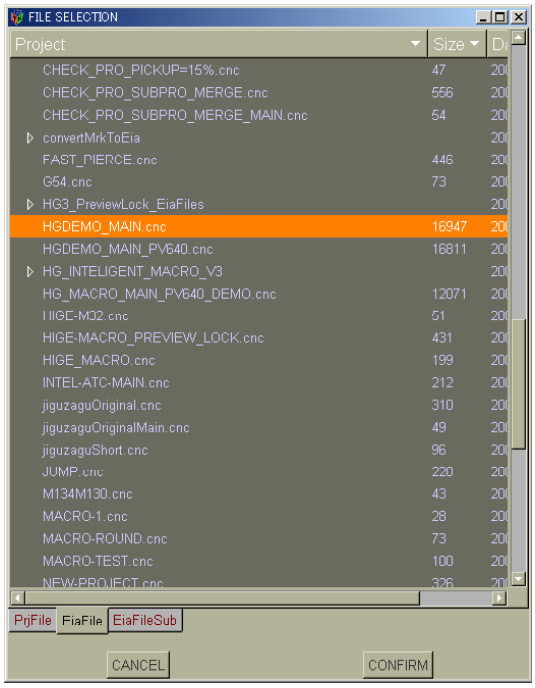
(1) Press the [COMMAND] key on the operating panel.

➔ The **COMMAND** screen will be displayed.



(2) Press the **[FILE]** menu key.

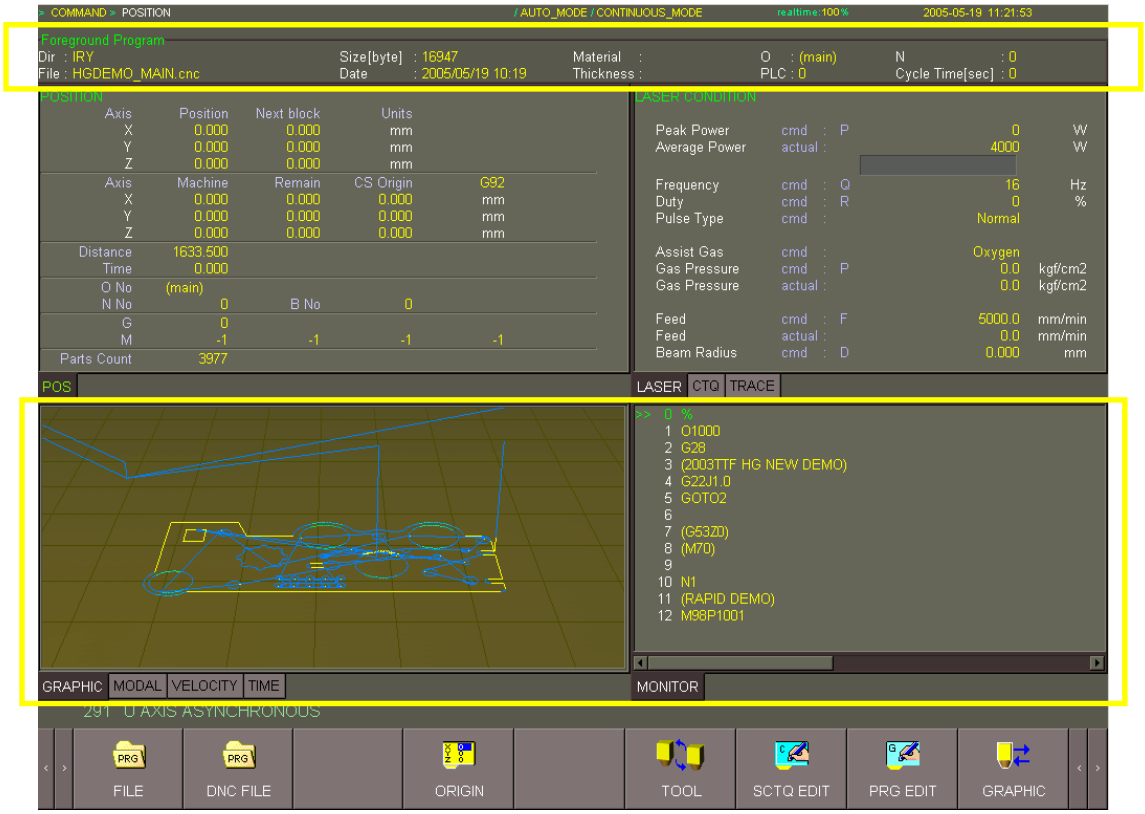
➔ The **FILE SELECTION** popup window will open.



(3) Select the program to be executed by pressing the [↓] key.

(4) Press the [TAB] key to select the **[CONFIRM]** button and then press the [INPUT] key.

➔ The information in the **Foreground Program** page, the **MONITOR** page and the **GRAPHIC** page changes to the information of the selected program.



(5) Press the [AUTO] mode selection key on the operating panel.

➔ This selects the automatic operation mode.

(6) Press the [CYCLE START] button on the operating panel.

Before pressing the [CYCLE START] button, make sure to confirm that the program to be executed is correct.

➔ This executes the program.

3-8 Tool Path Check

You can check the tool path on the **GRAPHIC** screen. Tool path check is possible even during automatic operation.

On the **COMMAND** screen, display of tool path is possible in the graphic page.

(1) Press the [GRAPHIC] key on the operating panel.

➔ The **GRAPHIC** screen will be displayed.

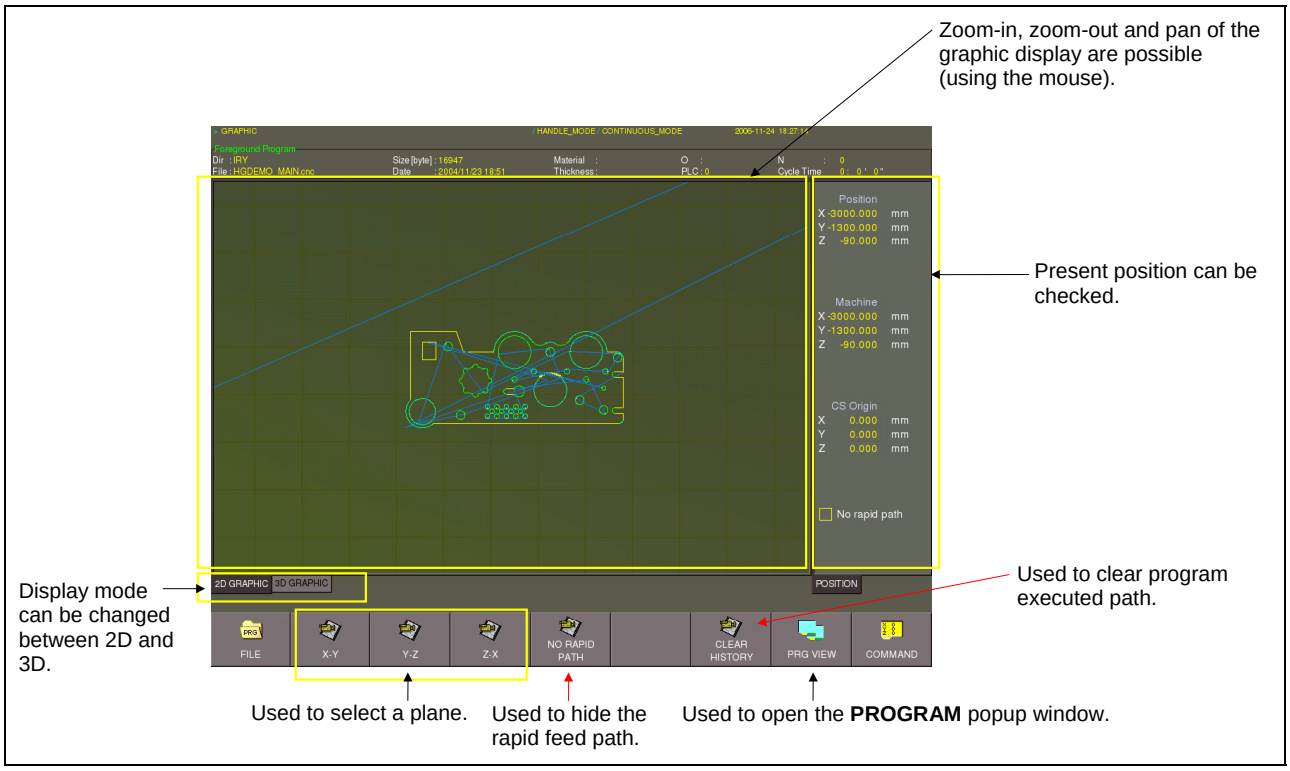


Fig. 3-2

3-8-1 2D graphic display

In the 2D graphic display mode, you can check the tool path (machining shape) from the top in the X-Y plane.

(1) Select the **2D GRAPHIC** page.

➔ The tool path is drawn in the 2D graphic display mode.

(2) Press the **[X-Y]** menu key.

➔ The tool path is drawn in the X-Y plane.

(3) Change the view position using the mouse.

(a) Pan

1) Move the mouse cursor to the center of the drawing area.

➔ The PAN cursor is displayed.

2) Move the mouse cursor to the desired direction.

➔ The drawn path moves as the mouse is operated.

(b) Zoom in/out

1) Move the mouse cursor to the upper right area in the drawing area.

➔ The ZOOM cursor is displayed.

2) Move the mouse cursor up to contract the drawn tool path.

➔ The drawn path is contracted.

Move the mouse cursor down to enlarge the drawn tool path.

➔ The drawn path is enlarged.

(c) Rotation

1) Move the mouse cursor to the lower area in the drawing area.

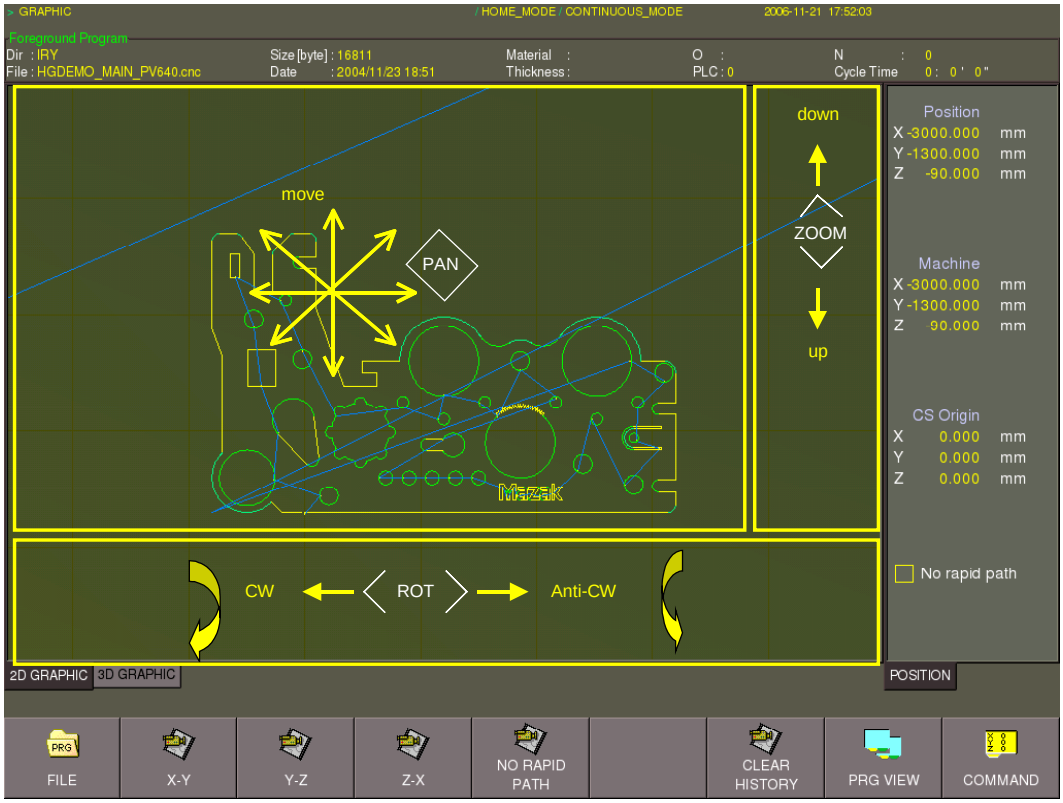
➔ The ROT cursor is displayed.

2) Move the mouse cursor right to rotate the drawn tool path CCW.

➔ The drawn path rotates CCW.

Move the mouse cursor left to rotate the drawn tool path CW.

➔ The drawn path rotates CW.



3-8-2 3D graphic display

In the 3D graphic display mode, you can check the tool path (machining shape) in the 3D drawing.

(1) Select the **3D GRAPHIC** page.

➔ The tool path is drawn in the 3D graphic display mode.

(2) Press the **[X-Y]**, **[Y-Z]** or **[Z-X]** menu key to select the desired plane.

➔ The tool path is drawn in the selected plane.

(3) Change the view position using the mouse.

(a) Pan

1) Move the mouse cursor to the center of the drawing area.

➔ The PAN cursor is displayed.

2) Move the mouse cursor to the desired direction.

➔ The drawn path moves as the mouse is operated.

(b) Zoom in/out

1) Move the mouse cursor to the upper right area in the drawing area.

➔ The ZOOM cursor is displayed.

2) Move the mouse cursor upward.

➔ The drawn path is contracted.

Move the mouse cursor downward.

➔ The drawn path is enlarged.

(c) Horizontal rotation

1) Move the mouse cursor to the lower area in the drawing area.

➔ The ROT cursor is displayed.

2) Move the mouse cursor rightward.

➔ The drawn path rotates CCW.

Move the mouse cursor leftward.

➔ The drawn path rotates CW.

(d) Vertical rotation

1) Move the mouse cursor to the left area in the drawing area.

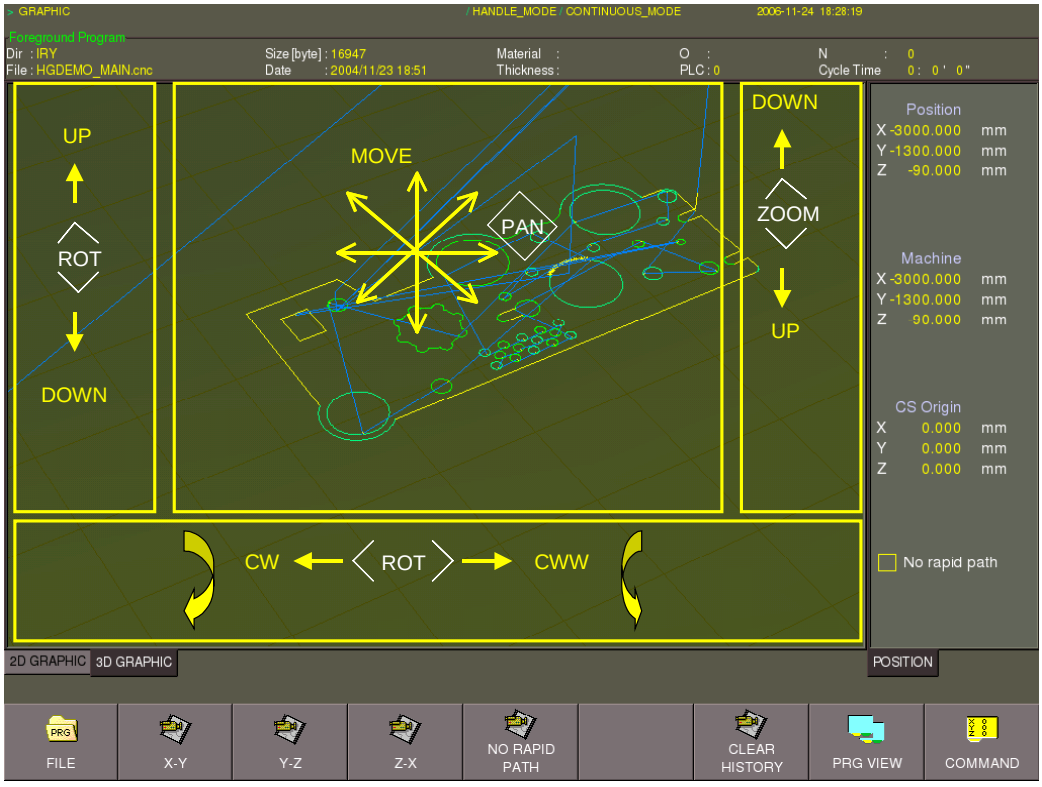
➔ The ROT cursor is displayed.

2) Move the mouse cursor upward.

➔ The drawn path rotates upward.

Move the mouse cursor downward.

➔ The drawn path rotates downward.



3-9 Alarm Check

When an alarm occurs with the machine, the corresponding alarm message is displayed in the field above the menu display area. If multiple alarms occurred simultaneously, these alarms can be checked by displaying the **ALARM** screen.

(1) Press the [ALARM] key on the operating panel.

➔ The **ALARM** screen will be displayed.

The alarm messages of the active alarms are displayed. Check details of the alarm and eliminate the cause (for more details, refer to the Maintenance Manual).

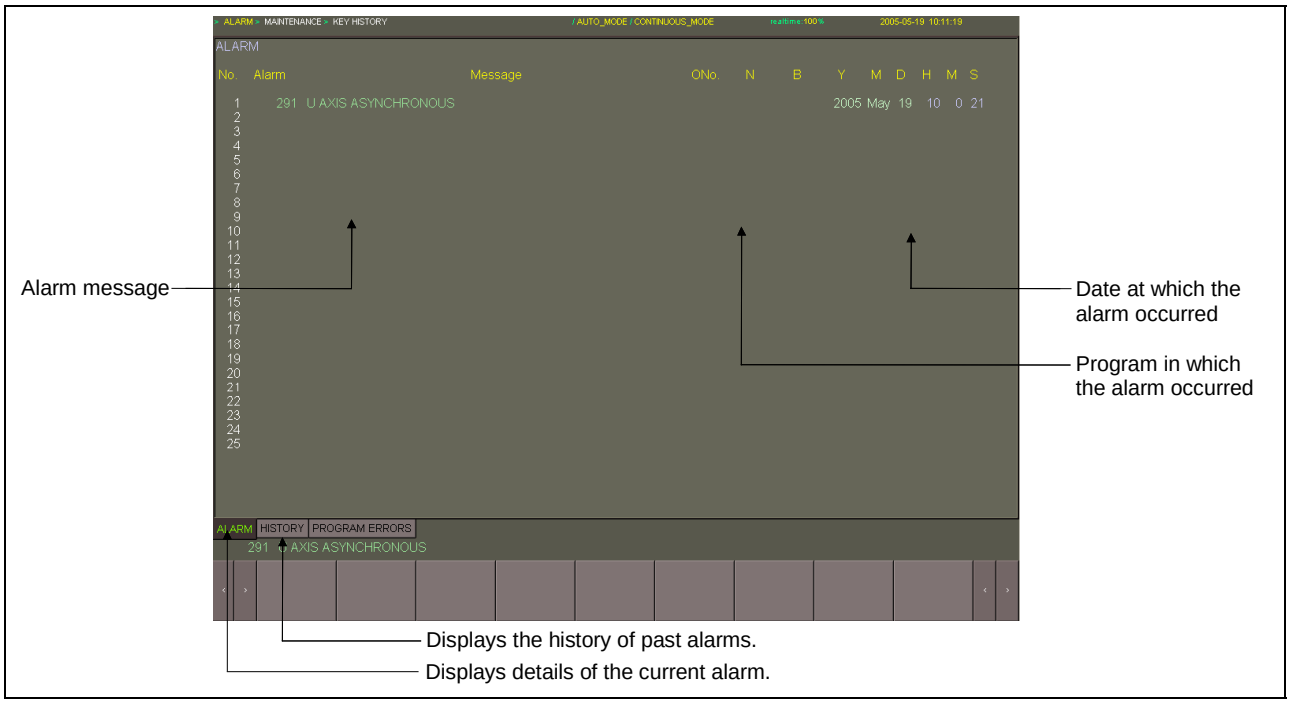

ALARM
No. Alarm Message ONo. N B Y M D H M S
1 291 U AXIS ASYNCHRONOUS 2005 May 19 10 0 21
ALARM
HISTORY
PROGRAM ERRORS
291 U AXIS ASYNCHRONOUS
Alarm message
Date at which the alarm occurred
Program in which the alarm occurred
Displays the history of past alarms.
Displays details of the current alarm.

Fig. 3-3

3-10 Override Function

You can optimize the axis feedrate and laser conditions temporarily using the override function.

(1) Press the [OVERRIDE] key on the operating panel.

➔ The **OVERRIDE** popup window will open.

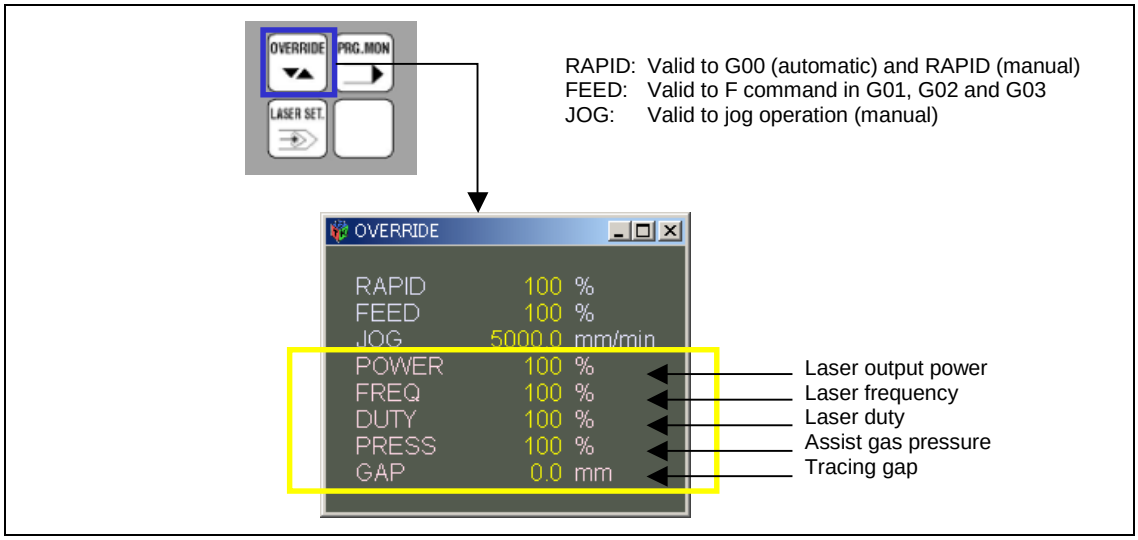


Fig. 3-4

(2) Press the override keys [▼] and [▲].

➔ Override value will change.

- The value changes continuously if the key is kept pressed.

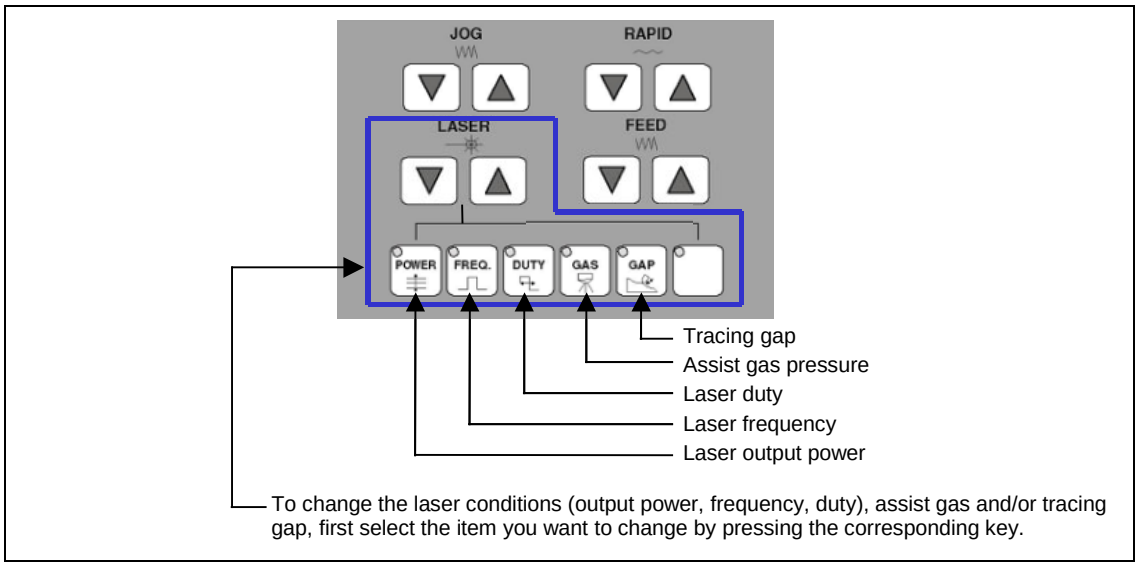


Fig. 3-5

Only in JOG override operation, you can set a desired feedrate to parameters and use them as the override values.

	Down ←									
Feedrate [mm/min]	100	500	1000	2000	3000	4000	5000	6000	7000	8000
Variable / Fixed	Parameter (variable)					Fixed values				
Parameter No.	N095	N096	N097	N098	N099	-				

	→ Up									
Feedrate [mm/min]	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000
Variable / Fixed	Fixed values									
Parameter No.	-									

3-11 Directly Inputting Jog Feedrate

Jog feedrate value can be changed by pressing the JOG override keys [▼] and [▲]. In addition, it is possible to manually enter the desired jog feedrate directly.

(1) Press the [LASER SET.] key on the operating panel.

➔ The **MANUAL LASER SCREEN** popup window will open.

(2) Press the [OVERRIDE] key on the operating panel.

➔ The **OVERRIDE** popup window will open.

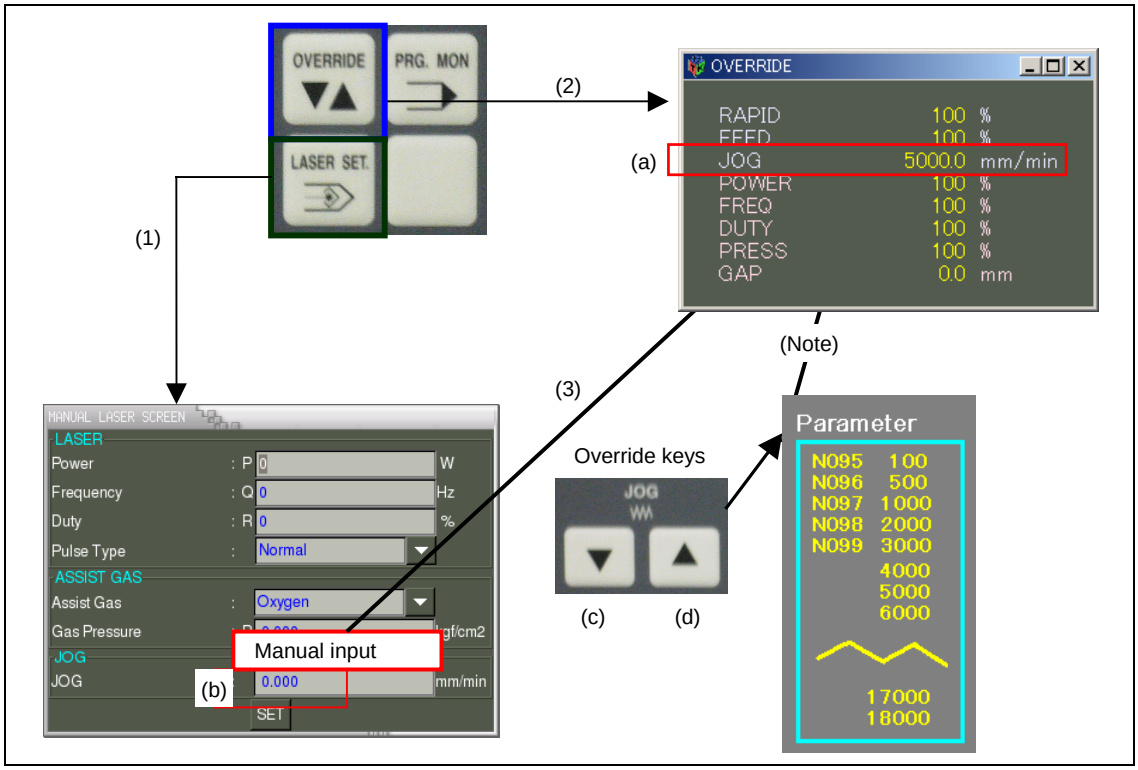


Fig. 3-6

(3) Enter the jog feedrate to the (b) field shown above.

Press the **[SET]** button and the entered value is set to the **JOG** field ((a) field).

*1: The entered jog feedrate is not enabled unless the **[SET]** button is pressed.

*2: When the **[SET]** button is pressed with a value exceeding the allowable maximum value (18000 mm/min or 708.66 inch/min) entered, the entered value is replaced with the maximum value (18000 mm/min or 708.66 inch/min) to be set.

Note: About actual feedrate

When changing the set jog feedrate using the override keys, use the keys (c) and (d).

The set jog feedrate value is always displayed in the (a) field, disregarding whether the jog feedrate is changed using the override keys or it is directly entered manually.

About initial value

1. When the [OVERRIDE] key is pressed for the first time after turning the power on, jog feedrate value “5000.0 mm/min” or “196.85 inch/min” is displayed at the **JOG** field. This is also true when the [LASER SET.] key is pressed for the first time.
2. When the jog feedrate value at the **JOG** field is changed using the override keys [▼] and [▲] or by manually entering the value, the changed or manually entered value is retained until the power is turned off. Therefore, if the **OVERRIDE** popup window is once closed and opened again, the changed or manually entered value is displayed.

About changing a feedrate value by manually entered value

1. The **JOG** filed in the **MANUAL LASER SCREEN** popup window displays the previously entered value. Accordingly, the value displayed in the **JOG** field may differ from the actual jog feedrate.
2. When the JOG override key [▼] or [▲] is pressed after manually entering a jog feedrate, the value changes in the manner as explained below.

   The JOG feedrate values are set as shown in the table below.

   If the JOG override key [▼] or [▲] is pressed for the first time after manually setting a jog feedrate, the jog feedrate value is set according to the processing as shown below.

No.	Parameter No.	Parameter Value
1	(Fixed)	18000
2	(Fixed)	17000
3	(Fixed)	16000
4	(Fixed)	15000
5	(Fixed)	14000
6	(Fixed)	13000
7	(Fixed)	12000
8	(Fixed)	11000
9	(Fixed)	10000
10	(Fixed)	9000
11	(Fixed)	8000
12	(Fixed)	7000
13	(Fixed)	6000
14	(Fixed)	5000
15	(Fixed)	4000
16	N099 (Variable)	3000
17	N098 (Variable)	2000
18	N097 (Variable)	1000
19	N096 (Variable)	500
20	N095 (Variable)	100

When “5500” is manually entered:

Pressing [▲] sets “6000”.

Pressing [▼] sets “5000”.

When “50” is manually entered: “100” is set disregarding the key to be pressed ([▼] or [▲]).

- When the [▼] key is pressed, parameter-set values are referenced starting from No. 20 toward No. 1, and the value that falls below and closest to the manually entered value is set. If such a value is not found, the value set at N095 is set, meaning that a value larger than the manually entered value may be set.

  Example 1: Pressing the [▼] key after manually entering “5500” will set jog feedrate value at “5000”.

  Example 2: Pressing the [▼] key after manually entering “50” will set jog feedrate value at the value set for N095.

- When the [▲] key is pressed, values are also referenced starting from No. 20 toward No. 1, and the value that exceeds the manually entered value first is set.

  Example: Pressing the [▲] key after manually entering “5500” will set jog feedrate value at “6000”.

3. In the “inch” mode, if a jog feedrate is manually entered, the entered value is not always displayed as the **JOG** value in the **OVERRIDE** popup window. There are cases that an approximate value of the manually entered value is displayed.
4. When the **[SET]** button is pressed after entering “0” manually, the jog feedrate is not changed.
5. When the **[SET]** button is pressed without entering a jog feedrate value manually (field is left blank), “100.0 mm/min” or “3.94 inch/min” is set at the **JOG** field.
6. In the “mm” mode, when the **[SET]** button is pressed while a value in the range from “1” to “99” is manually entered, “100.0 mm/min” is set at the **JOG** field.

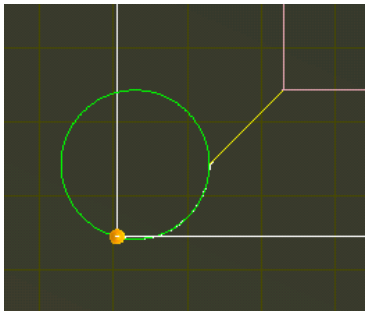
   In the “inch mode, when the **[SET]** button is pressed while a value in the range from “1” to “3” is manually entered, “3.94 inch/min” is set at the **JOG** field.

3-12 Restarting the Program Halfway

When an automatic operation is interrupted due to occurrence of an alarm or other reasons, you can restart the operation from the interrupted position after eliminating the cause of interruption.

Restart is possible in the automatic operation mode.

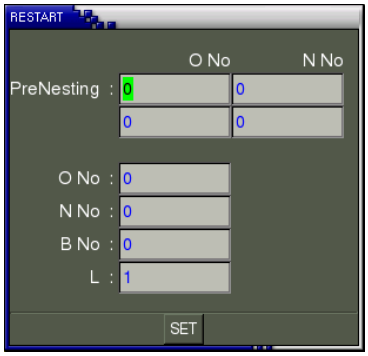
(1) If an automatic operation is interrupted due to occurrence of an alarm or other reasons, reset the CNC and remove the cause of the alarm.



(2) Move the machine position to the position where automatic operation was started by conducting zero return, etc.

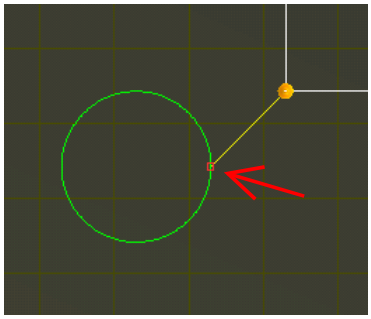
(3) Change the operation mode to the automatic operation mode and press the [RESTART] key.

The **RESTART** window opens and the program position where the automatic operation was interrupted is displayed. If necessary, it is possible to change the displayed values to change the restart position.



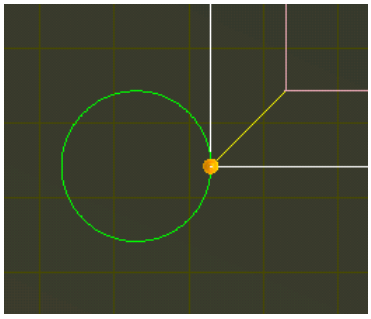
(4) Press the **[SET]** button, and program search starts.

After the completion of program search, the machine is placed in the single-block stop status and a red mark is displayed at the program restart point on the **GRAPHIC** screen.

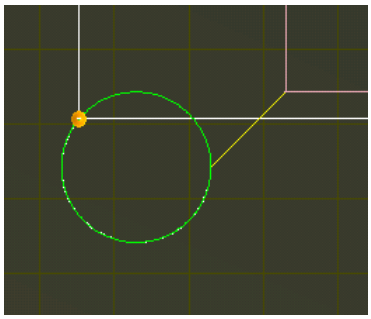


(5) Press the [CYCLE START] button.

Axes start moving to the program restart point (restart approach) and stop at the restart point in the single block status.



(6) Cutting restarts from the program restart point when the [CYCLE START] button is pressed again.



3-13 Setting the Tool Data

Note: Contents of display on the **TOOL DATA** screen and operation method differ depending on machine models. In this manual, explanation is given using the screen of the HG510 (4-tool magazine specification) as an example.
(For details, refer to Operating Manual for INTELLIGENT LOOP SYSTEM.)

Display the **TOOL DATA** screen to register the torches and nozzles that are set in the tool magazine and the nozzle magazine, respectively. If you make a mistake in this registration, a wrong tool will be used for cutting. Make sure to set the correct data.

(1) Press the [COND.] key twice on the operating panel.

➔ The **TOOL DATA** screen will be displayed.

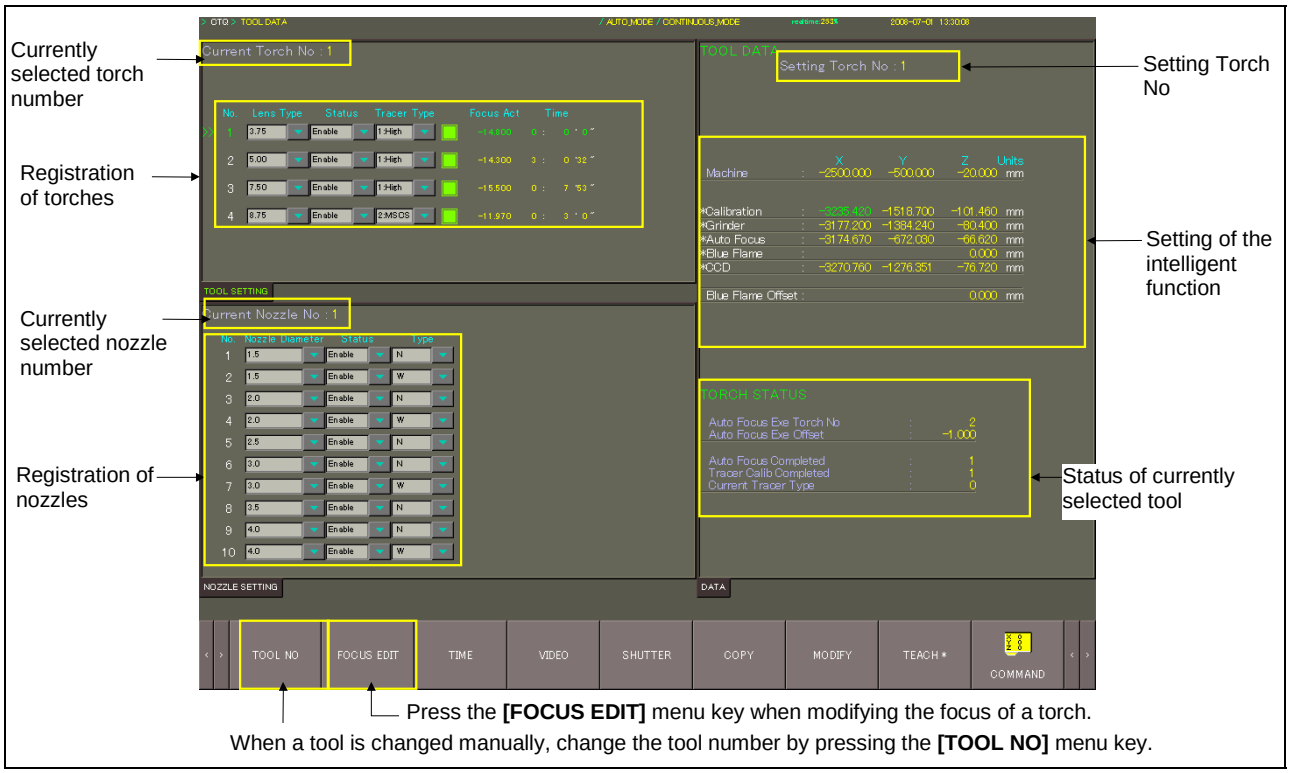


Fig. 3-7

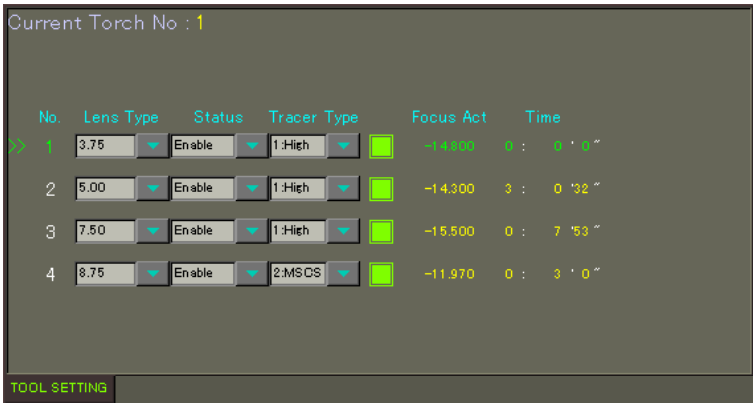
3-13-1 Registering torches

Register the torch, which is set in the tool magazine, to the CNC.

(1) Press the [COND.] key twice on the operating panel.

➔ The **TOOL DATA** screen will be displayed.

(2) Select the **TOOL SETTING** page.

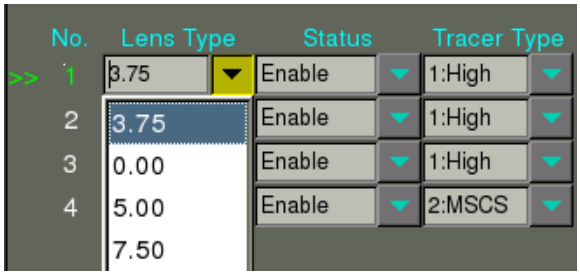

Current Torch No : 1
No. Lens Type Status Tracer Type Focus Act Time
>> 1 3.75 Enable 1:High -14.800 0 : 0 ' 0 "
2 5.00 Enable 1:High -14.300 3 : 0 '32 "
3 7.50 Enable 1:High -15.500 0 : 7 '53 "
4 8.75 Enable 2:MSCS -11.970 0 : 3 ' 0 "
TOOL SETTING

(3) Select “Torch No. 1” by pressing the [TAB] key.

(4) Press the [↓] key to select the torch (lens type).

When you use the mouse to select the torch, the pull down menu is displayed as shown below.

Example: Selecting “3.75” (inch lens).



- Select “0.00” for the torch number where no torch is set.

(5) Repeat steps (3) to (4) to register all torches.

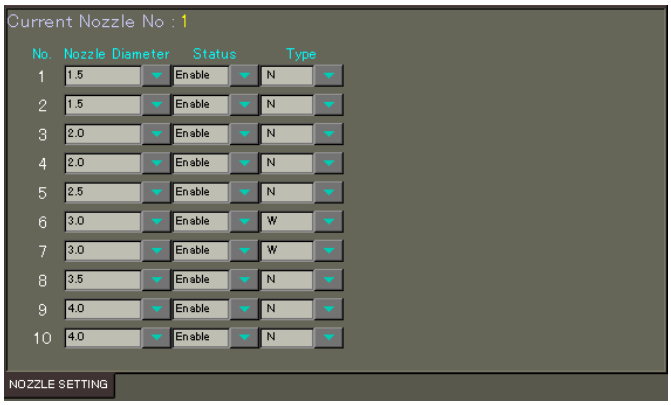
3-13-2 Registering nozzles

Register the nozzle, which is set in the tool magazine, to the CNC.

(1) Press the [COND.] key twice on the operating panel.

➔ The **TOOL DATA** screen will be displayed.

(2) Select the **NOZZLE SETTING** page.

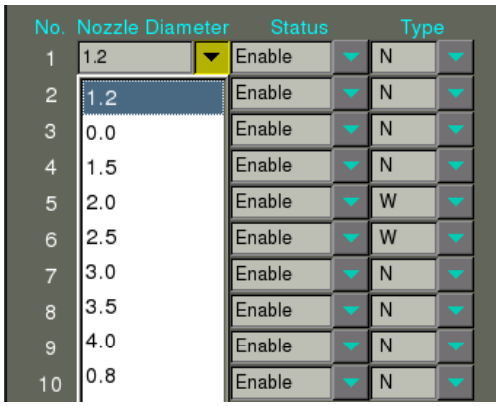

Current Nozzle No : 1
No. Nozzle Diameter Status Type
1 1.5 Enable N
2 1.5 Enable N
3 2.0 Enable N
4 2.0 Enable N
5 2.5 Enable N
6 3.0 Enable W
7 3.0 Enable W
8 3.5 Enable N
9 4.0 Enable N
10 4.0 Enable N
NOZZLE SETTING

(3) Select “Nozzle No. 1” by pressing the [TAB] key.

(4) Press the [↓] key to select the nozzle diameter.

When you use the mouse to select the nozzle diameter, the pull down menu is displayed as shown below.

Example: Selecting “1.2”


No. Nozzle Diameter Status Type
1 1.2 Enable N
2 1.2 Enable N
3 0.0 Enable N
4 1.5 Enable N
5 2.0 Enable W
6 2.5 Enable W
7 3.0 Enable N
8 3.5 Enable N
9 4.0 Enable N
10 0.8 Enable N

- Select “0.00” for the nozzle number where no nozzle is set.

(5) Repeat steps (3) to (4) to register all torches.

3-14 Checking and Correcting the Offset Data

Use the **OFFSET** screen to set the work offset data and the beam radius offset data.

(1) Press the [OFFSET] key on the operating panel.

➔ The **OFFSET** screen will be displayed.

Fig. 3-8

3-14-1 Setting the work offset data

On the **WORK OFFSET** page in the **OFFSET** screen, you can set the work offset data, which is used as the reference position of the work coordinate systems G54 - G59. For details of G54 - G59, please refer to the Programming Manual.

(1) Press the [OFFSET] key on the operating panel.

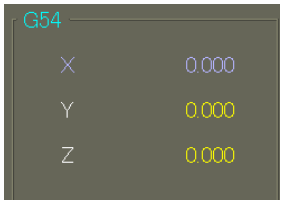
➔ The **OFFSET** screen will be displayed.

(2) Select the **WORK OFFSET** page.

(3) Select the position of the data to be modified by locating the cursor on it.

➔ The selected value is highlighted.

Example: Selecting X of G54



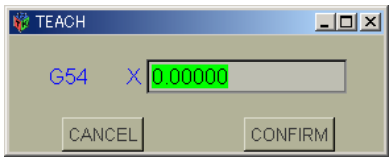
(4) Modify the value.

There are three methods for modifying the value.

(a) Entering the value to be added in reference to the current position data (machine coordinate value)

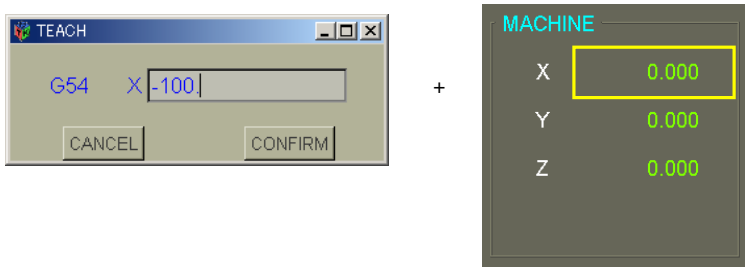
1) Press the **[TEACH]** menu key.

➔ The **TEACH** popup window will open.



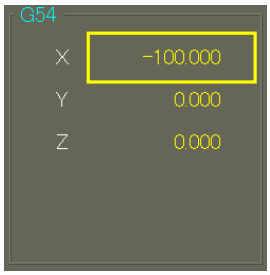
2) Enter the value to be added to the current machine coordinate value.

Example: To add "–100." to the current value "X0."



3) Press the **[CONFIRM]** button.

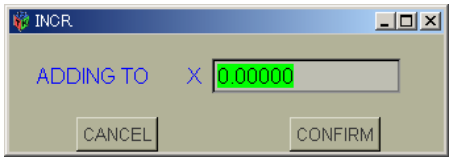
Example: X = 0. + (–100.)
= –100.



(b) Entering the value to be added in reference to the current work coordinate value

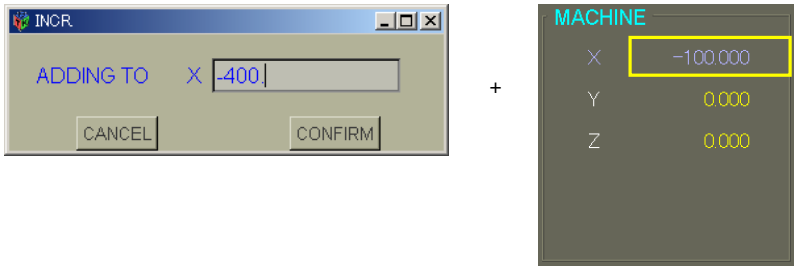
1) Press the **[INCR.]** menu key.

➔ The **INCR** popup window will open.



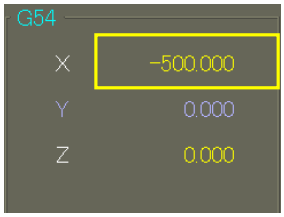
2) Entering the value to be added to the current position data (work coordinate value)

Example: To add "–400." to the current value "X–100."



3) Press the **[CONFIRM]** button.

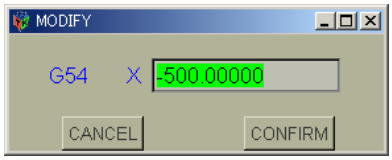
Example: X = –100. + (–400.)
= –500.



(c) Directly modifying the current position data (work coordinate value)

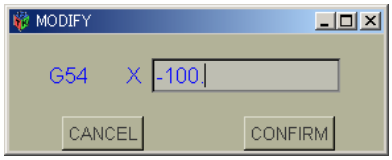
1) Press the **[MODIFY]** menu key.

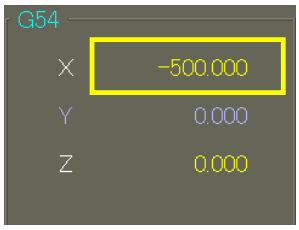
➔ The **MODIFY** popup window will open.



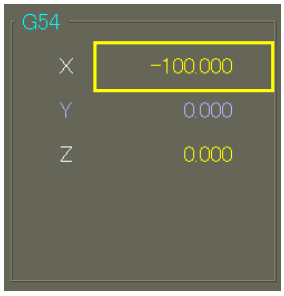
2) Enter the desired coordinate value.

Example: To modify “X–500.” to “X–100.”





3) Press the **[CONFIRM]** button.



3-14-2 Setting the beam radius offset data

On the **BEAM OFFSET** page in the **OFFSET** screen, you can set the beam radius offset data, which is used as the offset data to be called by a D code specified with G41 / G42. For details of G41 and G42, refer to the Programming Manual.

(1) Press the [OFFSET] key on the operating panel.

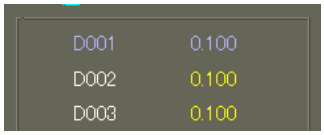
➔ The **OFFSET** screen will be displayed.

(2) Select the **BEAM OFFSET** page by pressing the window selection key.

(3) Select the value to be modified by locating the cursor on it.

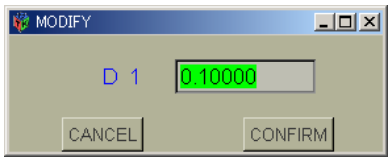
➔ The selected value is highlighted.

Example: Changing the offset value of D001



(4) Press the **[MODIFY]** menu key.

➔ The **MODIFY** popup window will open.

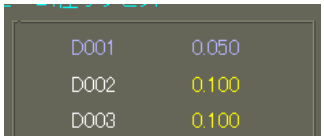


(5) Enter the beam radius offset value.

Example: Beam radius offset value “0.05”

(6) Press the **[CONFIRM]** button.

➔ Current offset value is updated to the entered value.



3-15 Checking and Modifying the Macro Variables

CNC provides the **MACRO VARIABLE** screen. When user macro is used, it is possible to check and modify the common macro variables using this screen.

(1) Press three times the [PARAM.] key on the operating panel.

➔ The **MACRO VARIABLE** screen will be displayed.

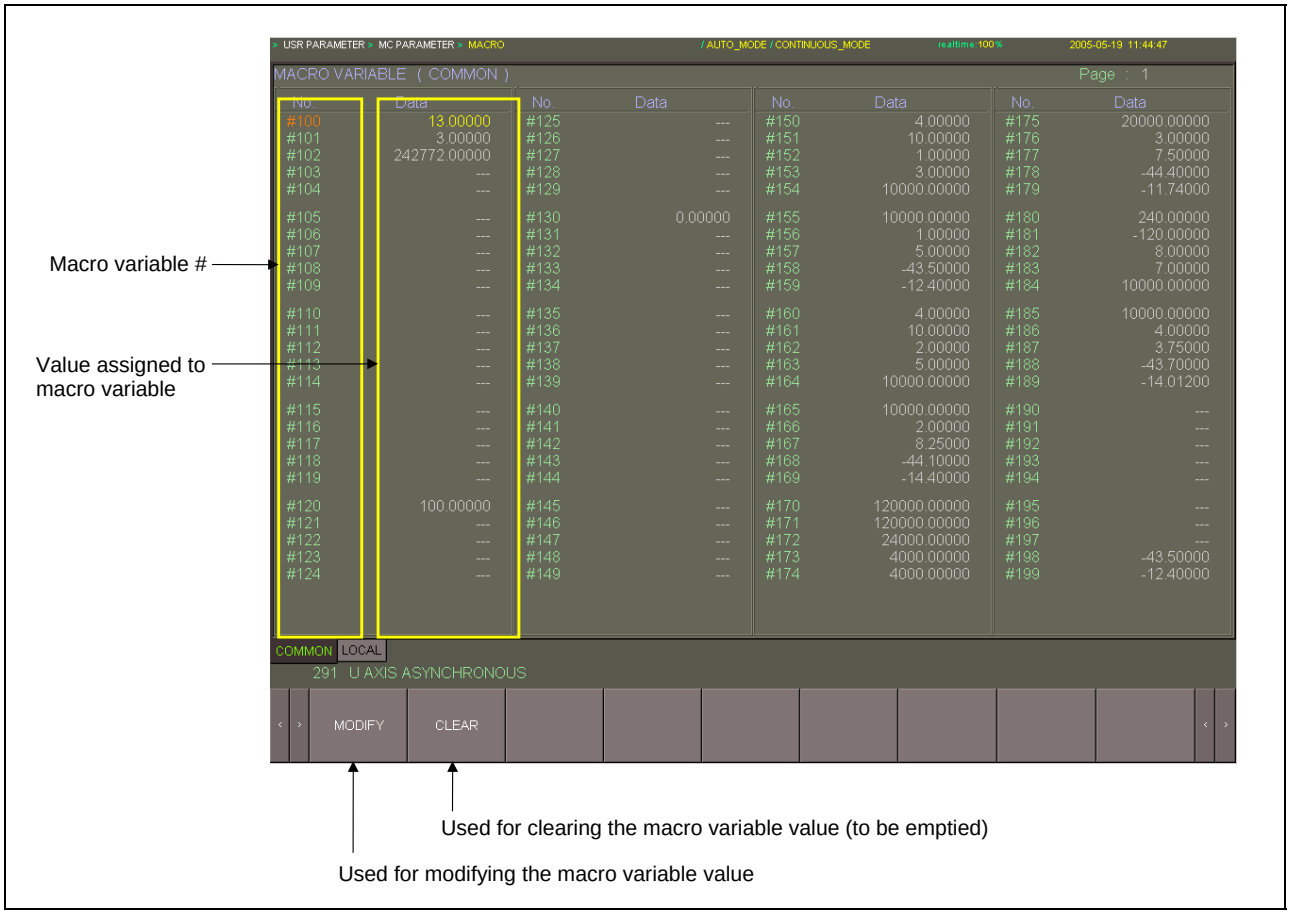


Fig. 3-9

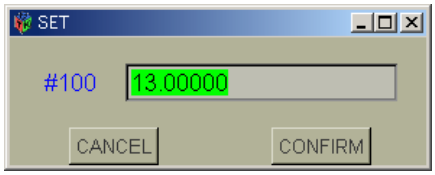
(2) Select the macro variable to be modified by pressing the [↓] and [↑] keys.

Example: Selecting #100

- The display screen changes when the [Page ↑] or [Page ↓] key is pressed.

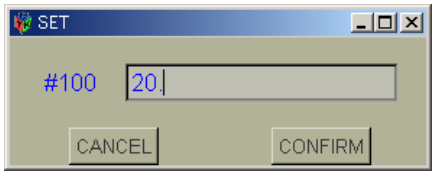
(3) Press the **[MODIFY]** menu key.

➔ The **SET** popup window will open.



(4) Enter the desired value.

Example: Entering the value of “20.”.



(5) Select the **[CONFIRM]** button by pressing the [TAB] key.

(6) Press the [INPUT] key.

➔ The macro variable setting value is updated to the entered value.

When clearing the macro variable value

(3) Press the **[CLEAR]** menu key.

➔ The macro variable setting value is cleared to be empty.

3-16 Checking and Modifying the User Parameters

CNC provides the **Parameter** screen for checking and modifying the values set for the parameters.

(1) Press the [PARAM.] key on the operating panel.

➔ The **Parameter** screen will be displayed.

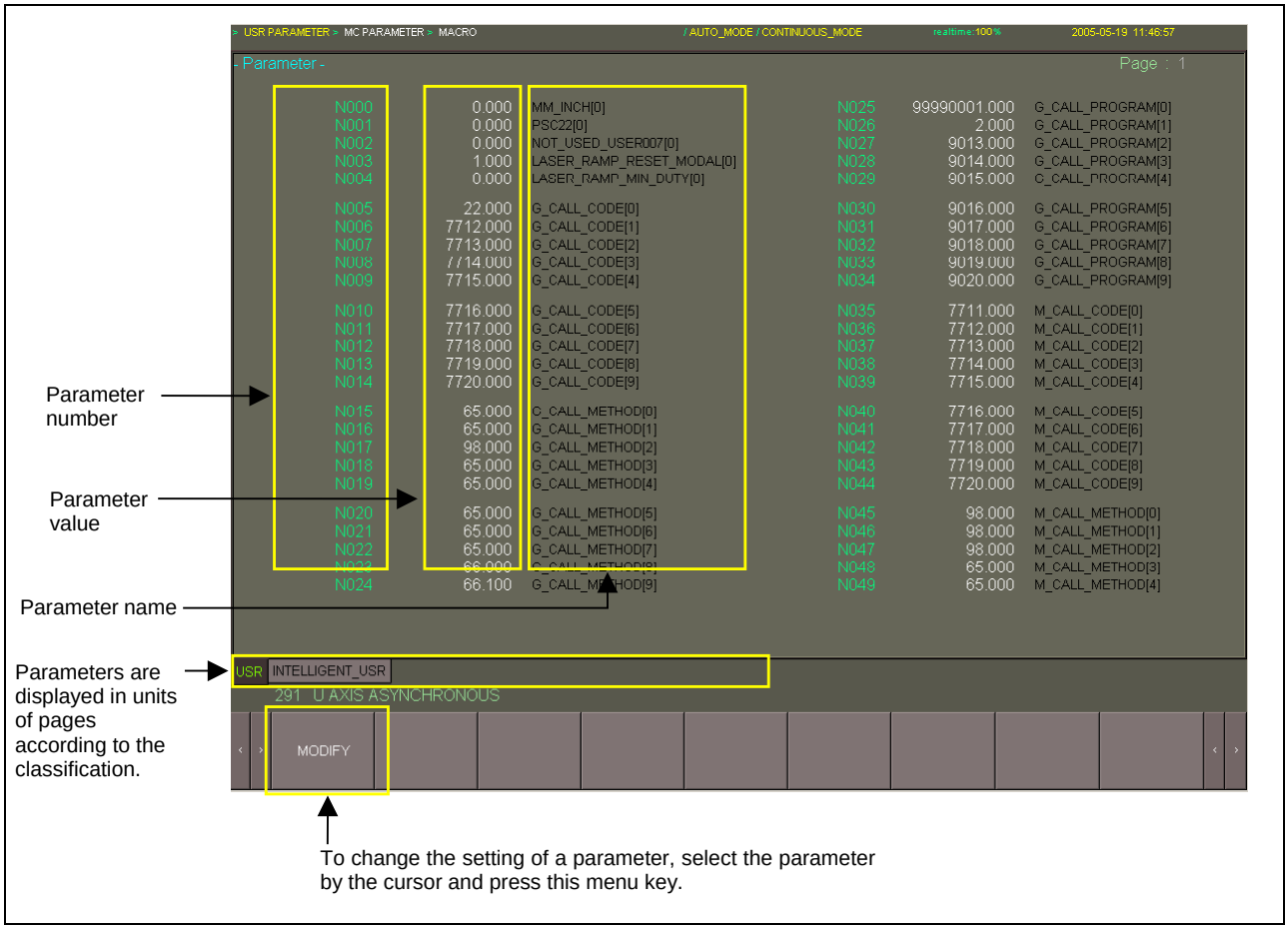
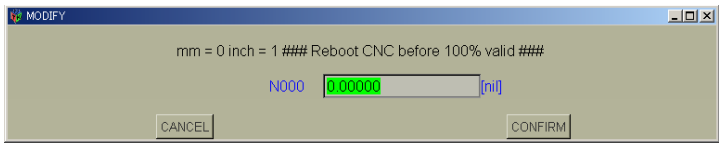

Parameter number
Parameter value
Parameter name
Parameters are displayed in units of pages according to the classification.
To change the setting of a parameter, select the parameter by the cursor and press this menu key.
MODIFY

Fig. 3-10

(2) Select the macro variable by pressing the [↓] and [↑] keys.

(3) Press the **[MODIFY]** menu key.

➔ The **MODIFY** popup window will open.



(4) Enter the desired value.

(5) Select the **[CONFIRM]** button by pressing the [TAB] key.

(6) Press the [INPUT] key.

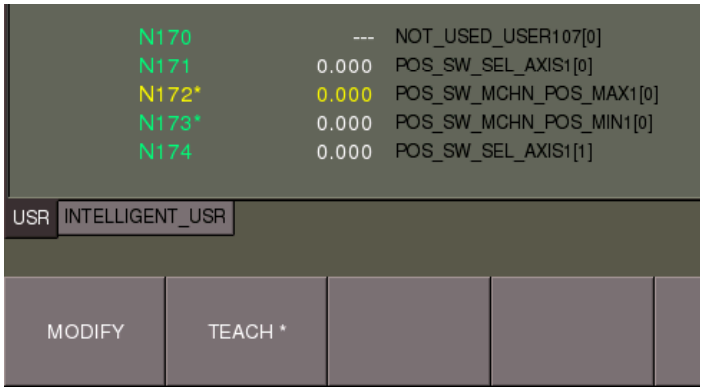
➔ The value set for the selected parameter is modified to the entered value.

3-17 Modifying the User Parameter Setting (Nozzle Position Data)

Parameters that require setting of coordinate values are identified by an asterisk (*).

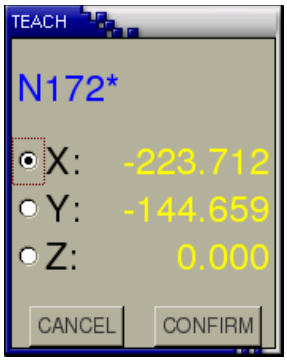
Setting of a value for these parameters is facilitated using the TEACH function.

(1) Move the cursor to a parameter suffixed with an asterisk (*). by pressing the [↓] and [↑] keys.



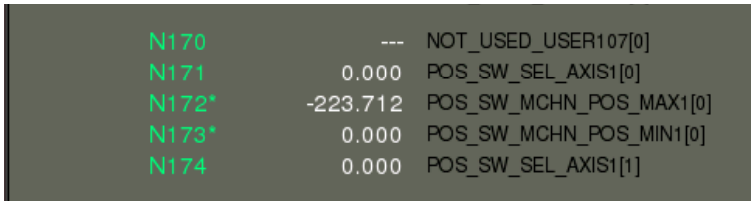
(2) Press the **[TEACH]** menu key.

➔ The **TEACH** popup window will open.



(3) Select the axis and press the **[CONFIRM]** button.

➔ The machine coordinate value of the selected axis is set for the parameter.



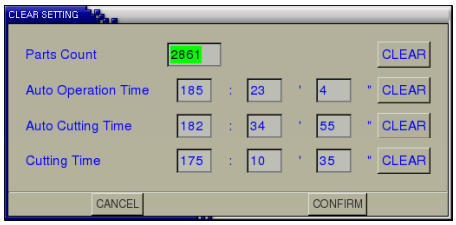
3-18 Modifying the Parts Count and Automatic Operation Time Data

The **Parts Counter** data and the **Auto Operation Time** on the **COMMAND** screen can be changed using the following procedure.

(1) Press the **[CLEAR SETTING]** menu key on the **COMMAND** screen.

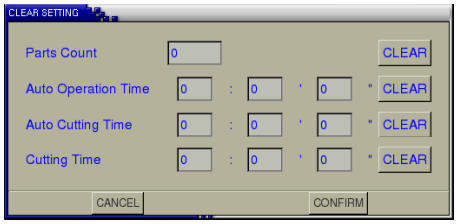
CYCLE TIME
Auto Operation Time 0 : 0 ' 0 "
Auto Cutting Time 0 : 0 ' 0 "
Macro Interrupt Time 0 : 0 ' 0 "
TOTAL TIME
CNC Power On Time 991 : 44 ' 46 "
Laser Power On Time 913 : 0 ' 0 "
Auto Operation Time 185 : 23 ' 4 "
Auto Cutting Time 182 : 34 ' 55 "
Cutting Time 175 : 10 ' 35 "
Macro Interrupt Time 0 : 0 ' 0 "
GRAPHIC
MODAL
VELOCITY
TIME
PRG
FILE
CLEAR SETTING

The popup window as shown below will open.


CLEAR SETTING
Parts Count 2861 CLEAR
Auto Operation Time 185 : 23 ' 4 " CLEAR
Auto Cutting Time 182 : 34 ' 55 " CLEAR
Cutting Time 175 : 10 ' 35 " CLEAR
CANCEL
CONFIRM

(2) Enter the data for the desired items.

To clear the value to zero, press the **[CLEAR]** button of each item.


CLEAR SETTING
Parts Count 0 CLEAR
Auto Operation Time 0 : 0 ' 0 " CLEAR
Auto Cutting Time 0 : 0 ' 0 " CLEAR
Cutting Time 0 : 0 ' 0 " CLEAR
CANCEL
CONFIRM

(3) Press the **[CONFIRM]** button and the entered data becomes valid.

CYCLE TIME
Auto Operation Time 0 : 0 ' 0 "
Auto Cutting Time 0 : 0 ' 0 "
Macro Interrupt Time 0 : 0 ' 0 "
TOTAL TIME
CNC Power On Time 991 : 46 ' 17 "
Laser Power On Time 913 : 0 ' 0 "
Auto Operation Time 0 : 0 ' 0 "
Auto Cutting Time 0 : 0 ' 0 "
Cutting Time 0 : 0 ' 0 "
Macro Interrupt Time 0 : 0 ' 0 "
GRAPHIC
MODAL
VELOCITY
TIME
PRG
FILE
CLEAR SETTING

3-19 Setting the Time Zone and Time

3-19-1 Setting the time zone

Note: The TIMEZONE SET function is supported only by the CNC software of v59.09 and above.

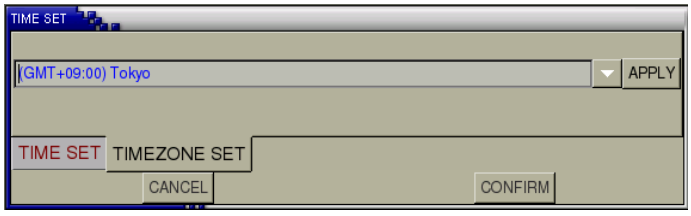
(1) Press the [SYSTEM] key on the operating panel.

➔ The **VERSION** screen will be displayed.

(2) Press the **[TIME SET]** menu key.

(3) Click the **[TIMEZONE SET]** button.

➔ The dialog box as shown below is displayed.



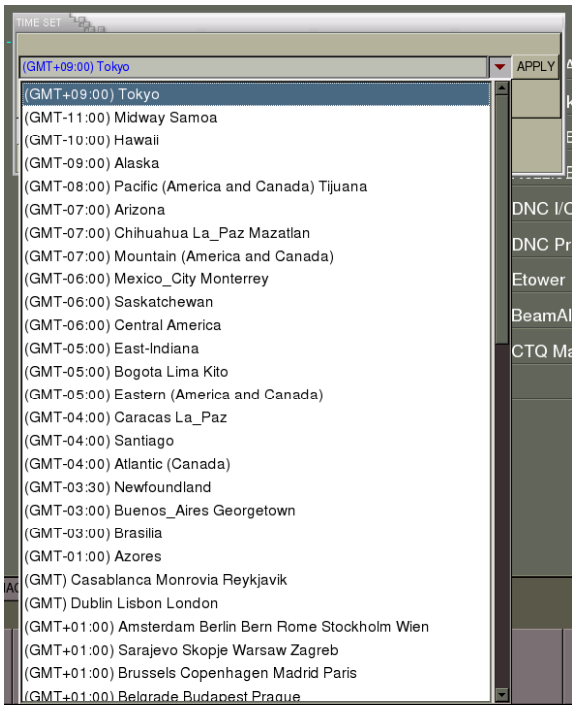
(4) Select the region by pressing the arrow symbol [↓] key.

When you use a mouse for this selection, the pull down menu is displayed as shown below.

Select your region referring to the region setting of your personal computer.

Indication of (GMT ± xx : xx) in each item shows time difference from the Greenwich mean time. Use this indication as the reference when you select the region.

Example: Selecting “Tokyo”



(5) Click the **[APPLY]** button.

(6) Click the **[CONFIRM]** button.

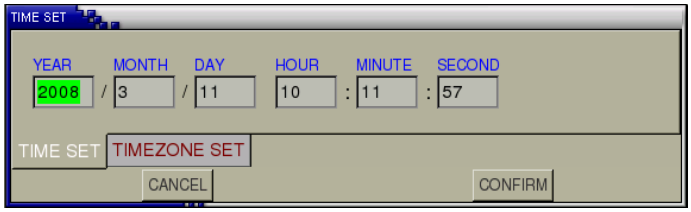
➔ The dialog box closes.

3-19-2 Setting the clock

(1) On the operating panel, press the screen selection key [SYSTEM] once to open the **VERSION** screen.

(2) Press the **[TIME SET]** menu key.

➔ The dialog box as shown below is displayed.



(3) Set the data for **YEAR**, **MONTH**, **DAY**, **HOUR**, **MINUTE** and **SECOND** in this order and click the **[CONFIRM]** button.

➔ The dialog box closes.

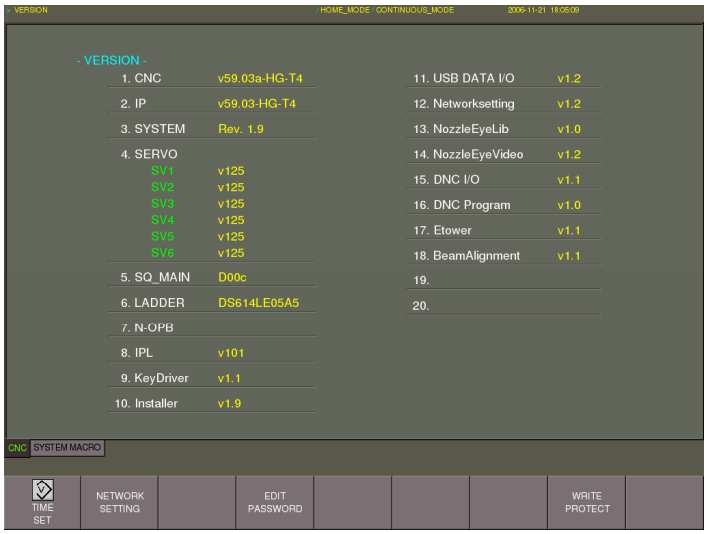
(4) Check the time data, displayed at the upper right area of the screen, to confirm that it has been updated to the set time.

3-20 Network Setting

Note: Explanation in this manual is provided assuming that the CNC is connected to your PC by hardware.
If connection by the network cable has not been completed, please contact Mazak service center.

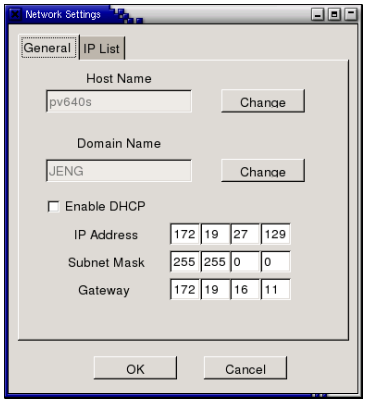
3-20-1 Network setting at the CNC

(1) On the operating panel, press the screen selection key [SYSTEM] once to open the **VERSION** screen.



(2) Press the **[NETWORK SETTING]** menu key.

➔ The dialog box as shown below is displayed.



(3) Ask your network administrator the Host Name (computer name), domain name, IP address, etc. and set them as shown below. To set the **Host Name** and **Domain Name**, press the **[Change]** button of each item.

After setting the network setting data, press the **[OK]** button to save the setting. After that shut off and start the CNC again.

For the system of Revision 1.9.1 and above (confirmed on the **VERSION** screen), **Enable DHCP** setting is displayed. If you select this item, the automatic IP address acquiring function is enabled. (This corresponds to the machines shipped with v59 and above. This is not displayed for the machines for which version upgrade is made after shipping.)

For the IP List, setting is not necessary for the purpose of connection to the PC.

3-20-2 Connecting user's PC to the CNC network

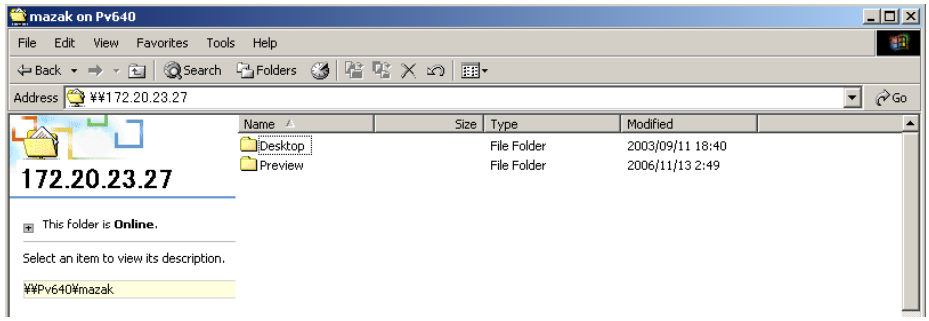
(1) In the start menu of your PC, select [Run…].

(2) Enter the IP address as indicated below and press the **[OK]** button.

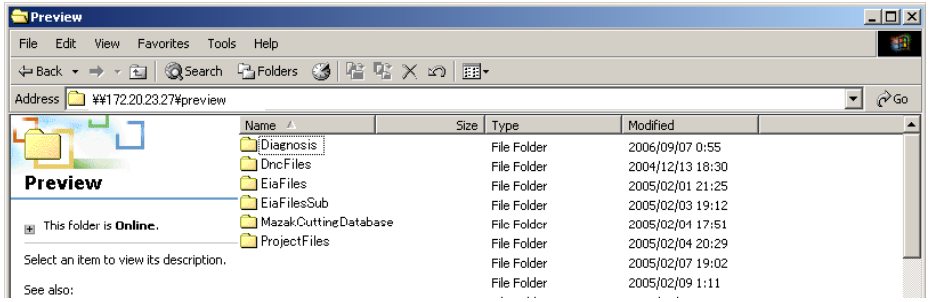
Example: When IP address is "172.20.23.27" (setting before shipping)
\\172.20.23.27 (enter two backslash codes and the IP address of the machine)

(3) The login window opens. Enter "preview" for **Connect As** and "preview" for **Password**.

The Explorer starts as shown below.



(4) Click "Preview", and the folders as shown below are displayed.



Note: The characteristics of the folders are explained below. Copy the necessary EIA programs.

* Only the four folders indicated below can be used. Do not operate other folders.

- **EiaFiles**
  EIA programs are saved in this folder. Folders can be created and deleted under this folder. Copying and deletion of files are also allowed.
- **ProjectFiles**
  Intelligent programs are saved in this folder. As with the EiaFiles folder, folder can be created and deleted as desired under this folder and, copying and deletion of files are also allowed.
- **EiaFilesSub**
  Subprograms are saved in this folder. The programs saved in this folder can be called from main programs saved in the EiaFiles folder as subprograms. If you create a subfolder under EiaFilesSub and save programs in this folder, Preview cannot use them.
- **MazakCuttingDatabase**
  Cutting conditions are saved in this folder.

3-21 Setting the Write-protection Function

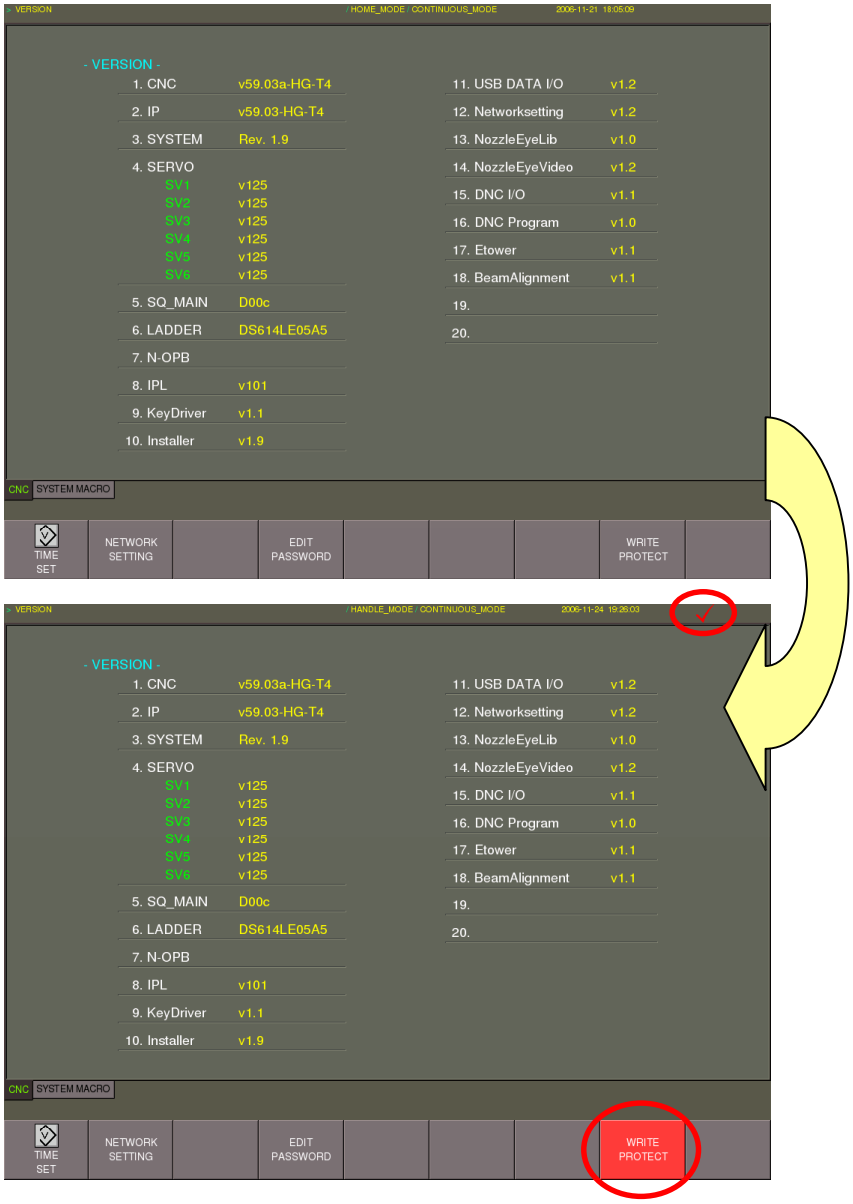
Conventionally, the memory write-protection function is turned ON/OFF using the hardware (key switch). The Preview CNC provides this feature by the entry of a password.

Default password: PREVIEW (upper case characters)

Note: If you change the password, please make sure to note down your password and keep it securely.
If you happen to forget the changed your password, please contact Mazak service center.

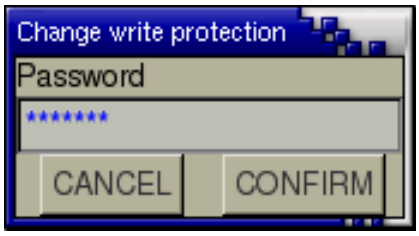
3-21-1 Setting the memory write-protection function

(1) On the operating panel, press the screen selection key [SYSTEM] once to open the **VERSION** screen.



(2) Press the **[WRITE PROTECT]** menu key.

➔ The dialog box as shown below is displayed.



(3) Enter the password and press the **[CONFIRM]** button.

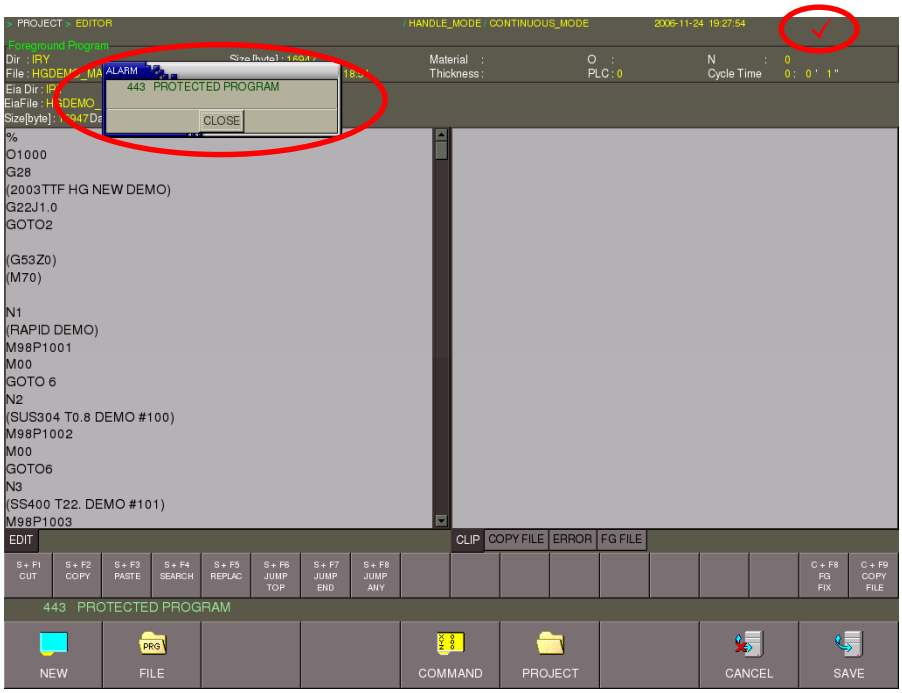
➔ The **[WRITE PROTECT]** menu if highlighted in red and the red check mark, representing write-protected status, appears at the upper right area of the screen.

While the red check mark is displayed, it indicates the memory is write-protected.

An alarm occurs if any of the operations below is attempted.

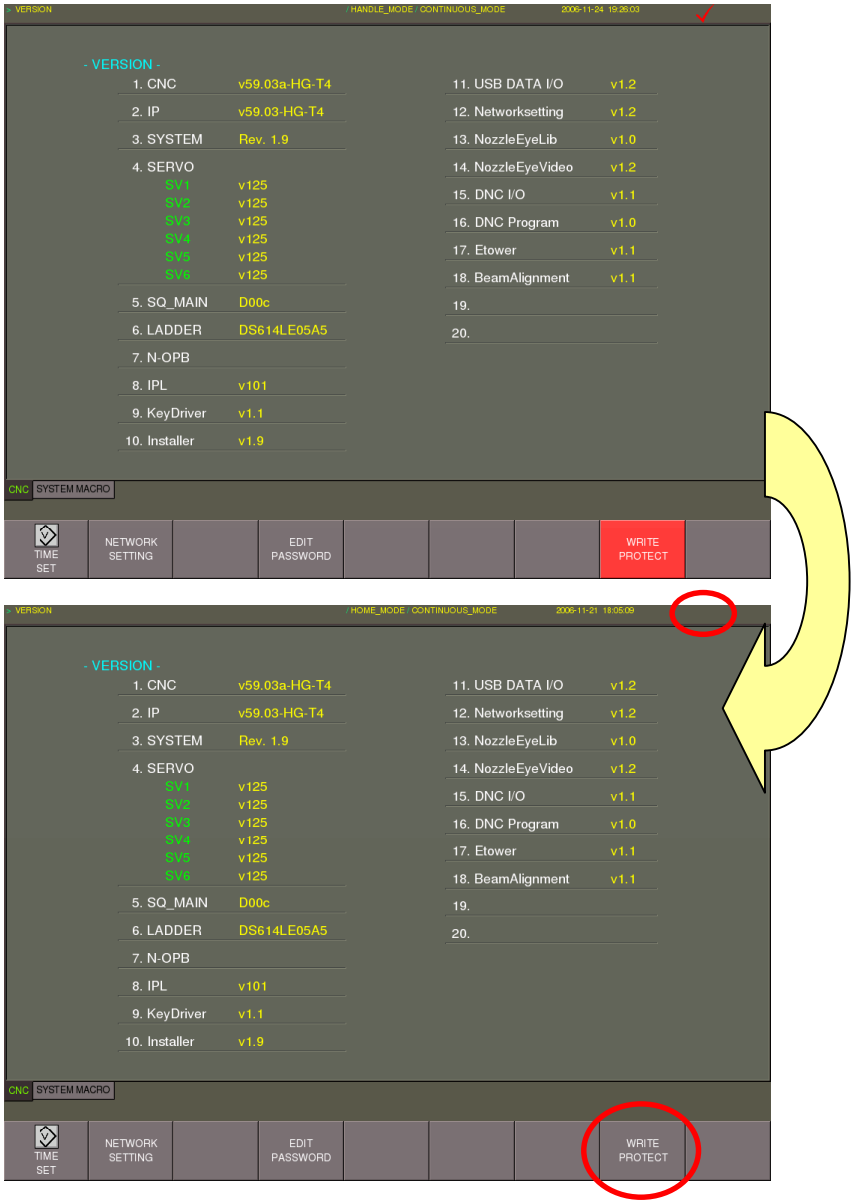
1) Program editing
2) Changing parameter settings
3) Loading programs / parameters

Example: If an attempt is made to edit a program, the alarm as shown below occurs.



3-21-2 Canceling the memory write-protection function

(1) On the operating panel, press the screen selection key [SYSTEM] once to open the **VERSION** screen.



(2) Press the **[WRITE PROTECT]** menu key.

➔ The dialog box as shown below is displayed.

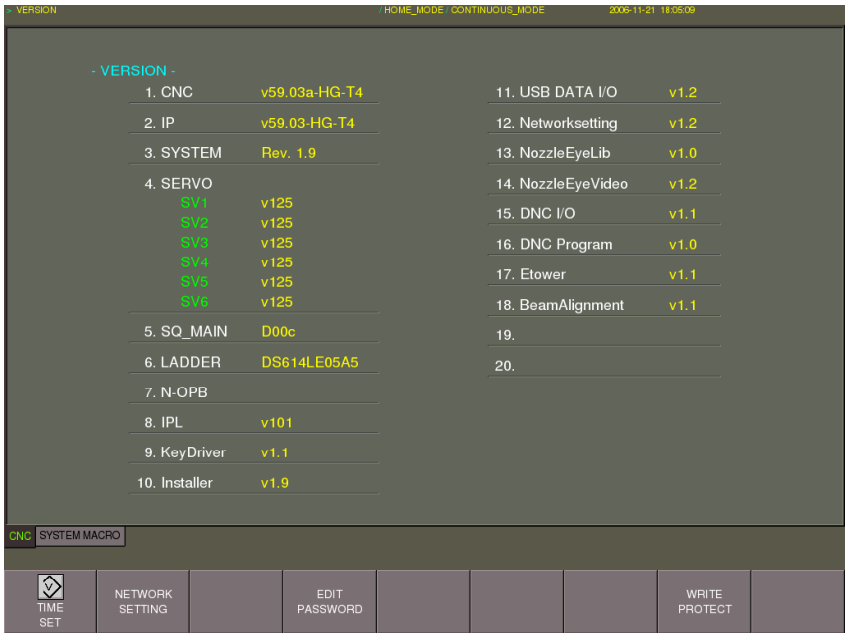
(3) Enter the password and press the **[CONFIRM]** button.

➔ The **[WRITE PROTECT]** menu, highlighted in red, returns to normal display and the red check mark disappears from the upper right area of the screen.

In this status, you can access the memory as usual.

3-21-3 Changing the password

(1) On the operating panel, press the screen selection key [SYSTEM] once to open the **VERSION** screen.



(2) Press the **[EDIT PASSWORD]** menu key.

➔ The dialog box as shown below is displayed.

(3) Enter the currently valid password.

(4) To confirm the new password, enter it two times.

(5) Click the **[CONFIRM]** button.

➔ The password entered in step (3) is correct.

➔ In password entry operation, repeated two times, in step (4), the entered passwords match with each other.

➔ When two conditions above are satisfied, the password is changed to the one entered in step (4).

Convention of passwords

A password must consist of 1 to 20 characters.

Upper / lower cases of characters are distinguished.

Special characters (_, +, –, #, $, !, ~, ^) are permitted.

Do not use others.

If used, there are cases that changing of a password is disabled.

Note: If you change the password, please make sure to note down your password and keep it securely.

If you happen to forget the changed your password, please contact Mazak service center.

3-22 Manual Operation Using the Switch Screen

You can manually operate the machine by displaying the **SWITCH** screen. Switches (buttons) displayed on this screen differ depending on machine models.

(1) Press the [SWITCH] key on the operating panel.

➔ The **SWITCH** screen will be displayed.

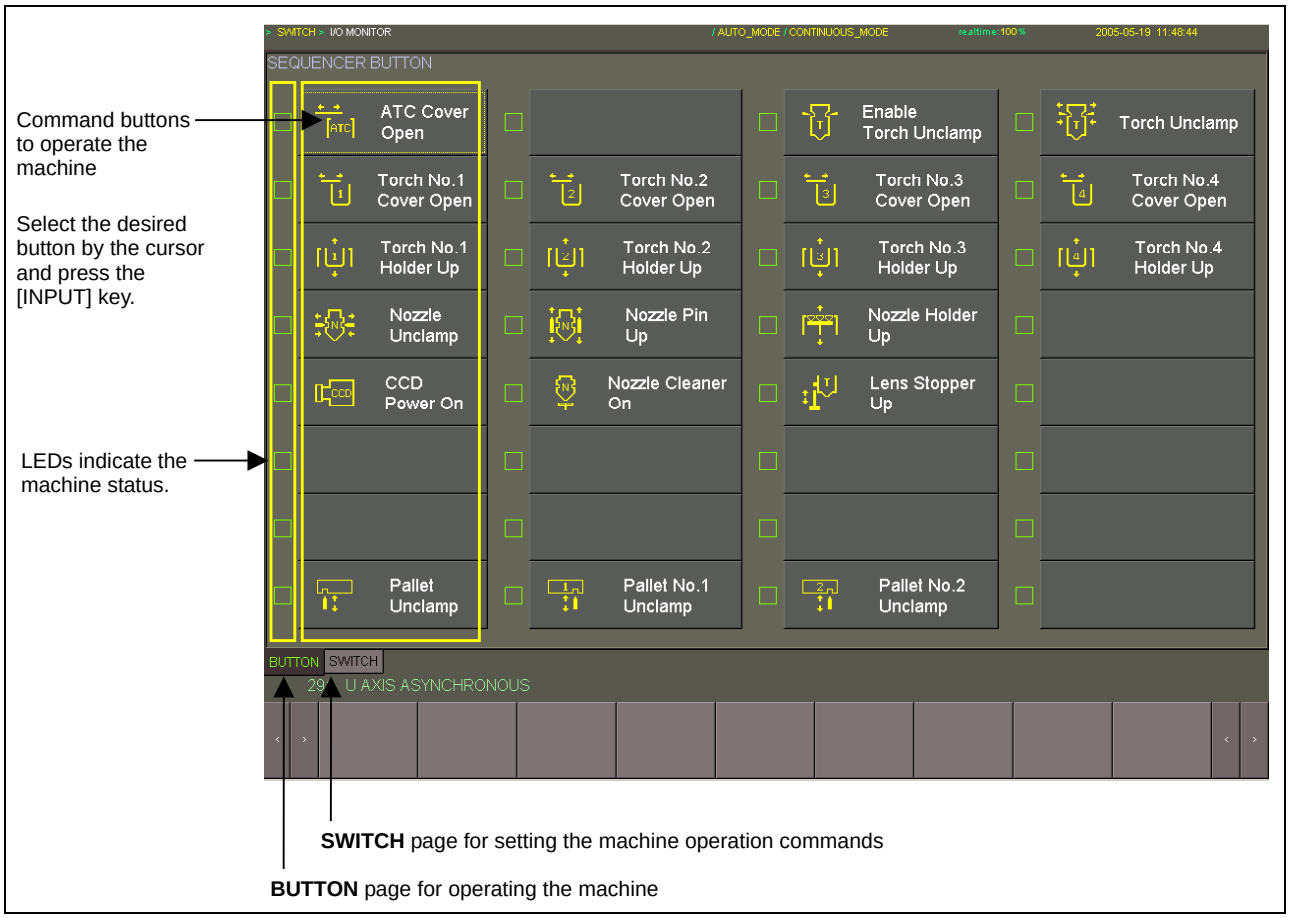


Fig. 3-11

3-23 Daily and Periodical Maintenance

You can check the required daily maintenance items and the schedule of periodical maintenance by displaying the **MAINTENANCE** screen.

(1) Press the [ALARM] key on the operating panel several times.

➔ The **MAINTENANCE** screen will be displayed.

- **Daily inspection items**

The screen displays the items to be checked before starting the machine.

ALARM > MAINTENANCE > KEY HISTORY
HOME_MODE / CONTINUOUS_MODE
2008-03-24 11:14:03
MAINTENANCE
START UP INSPECTION
1. CHECK PRESSURE OF LASER GAS CYLINDER MIN 10kg/cm2
2. CHECK PRESSURE OF ASSIST GAS CYLINDER
3. CHECK 2ND PRESSURE OF ASSIST GAS SET TO 8kg/cm2
4. CHECK 2ND PRESSURE OF H.P.ASSIST GAS SET TO 10kg/cm2
5. CHECK WATER LEVEL WITHIN MIN/MAX LEVEL
6. CHECK WATER QUALITY EXCHANGE EVERY 3 MONTHS
7. CHECK LUBRICATING OIL WITHIN MIN/MAX LEVEL
8. CHECK VACUUM PUMP OIL WITHIN MIN/MAX LEVEL
9. CHECK T/B OIL WITHIN MIN/MAX LEVEL
10. CHECK CHILLER WATER PRESSURE WITHIN 3 - 3.5kg/cm2
11. CHECK FOCAL LENS QUALITY EXCHANGE WHEN BAD COATING
12. CHECK NOZZLE QUALITY EXCHANGE WHEN BAD ORIFICE
13. CHECK FOCAL POINT
14. CHECK NOZZLE-MATERIAL DISTANCE
PERIODIC. MAINT. INFO.
START UP INSPECTION
UPDATE V/P OIL
UPDATE T/B OIL
UPDATE V/P FILTER
UPDATE AIR FILTER

- **Periodical inspection items**

For each inspection item, the time passed since last inspection is displayed.

This data can be used to judge the time to perform inspection next.

ALARM > MAINTENANCE > KEY HISTORY
HOME_MODE / CONTINUOUS_MODE
2008-03-24 11:13:31
LASER ON TIME 0 H
PERIODIC. MAINT. INFO.
NOW NEXT LAST
1. TIME TO EXCHANGE V/P OIL 0 / 750 (0)
2. TIME TO EXCHANGE T/B OIL 0 / 2000 (0)
3. TIME TO EXCHANGE V/P FILTER 0 / 2000 (0)
4. TIME TO EXCHANGE AIR FILTER IN CHILLER 0 / 2000 (0)
5. TIME TO EXCHANGE ELECTRODES 0 / 2000 (0)
6. TIME TO EXCHANGE PLASMA TUBES 0 / 2000 (0)
7. TIME TO EXCHANGE OUTPUT COUPLER 0 / 2000 (0)
8. TIME TO EXCHANGE REAR MIRROR 0 / 2000 (0)
9. TIME TO EXCHANGE INTERNAL BEND MIRRORS 0 / 2000 (0)
10. TIME TO EXCHANGE PHASE RETARDER 0 / 3000 (0)
11. TIME TO EXCHANGE EXTERNAL BEND MIRRORS 0 / 4000 (0)
12. TIME TO OVERHAUL VACUUM PUMP 0 / 4000 (0)
13. TIME TO OVERHAUL T/B 0 / 8000 (0)
14. TIME TO OVERHAUL H.V.TRANS. & CIRCUIT 0 / 8000 (0)
PERIODIC. MAINT. INFO.
START UP INSPECTION
UPDATE V/P OIL
UPDATE T/B OIL
UPDATE V/P FILTER
UPDATE AIR FILTER

After replacing vacuum pump oil, turbo blower oil, vacuum pump filter or air filter, press the **[UPDATE V/P OIL]**, **[UPDATE T/B OIL]**, **[UPDATE V/P FILTER]** or **[UPDATE AIR FILTER]** menu key corresponding to the replaced item to reset the time data (NOW) to “0”. The time data (NOW) can be used as the guide to determine the next replacement time.

- Inspection items vary depending on machine models. For details, please refer to the Maintenance Manual of the machine.

3-24 Checking the Signals of Sensors and Valves

You can check the status of the signals of the sensor and valves by displaying the **I/O MONITOR** screen. For I/O addresses, please refer to the electrical drawings.

(1) Press the [SWITCH] key on the operating panel several times.

➔ The **I/O MONITOR** screen will be displayed.

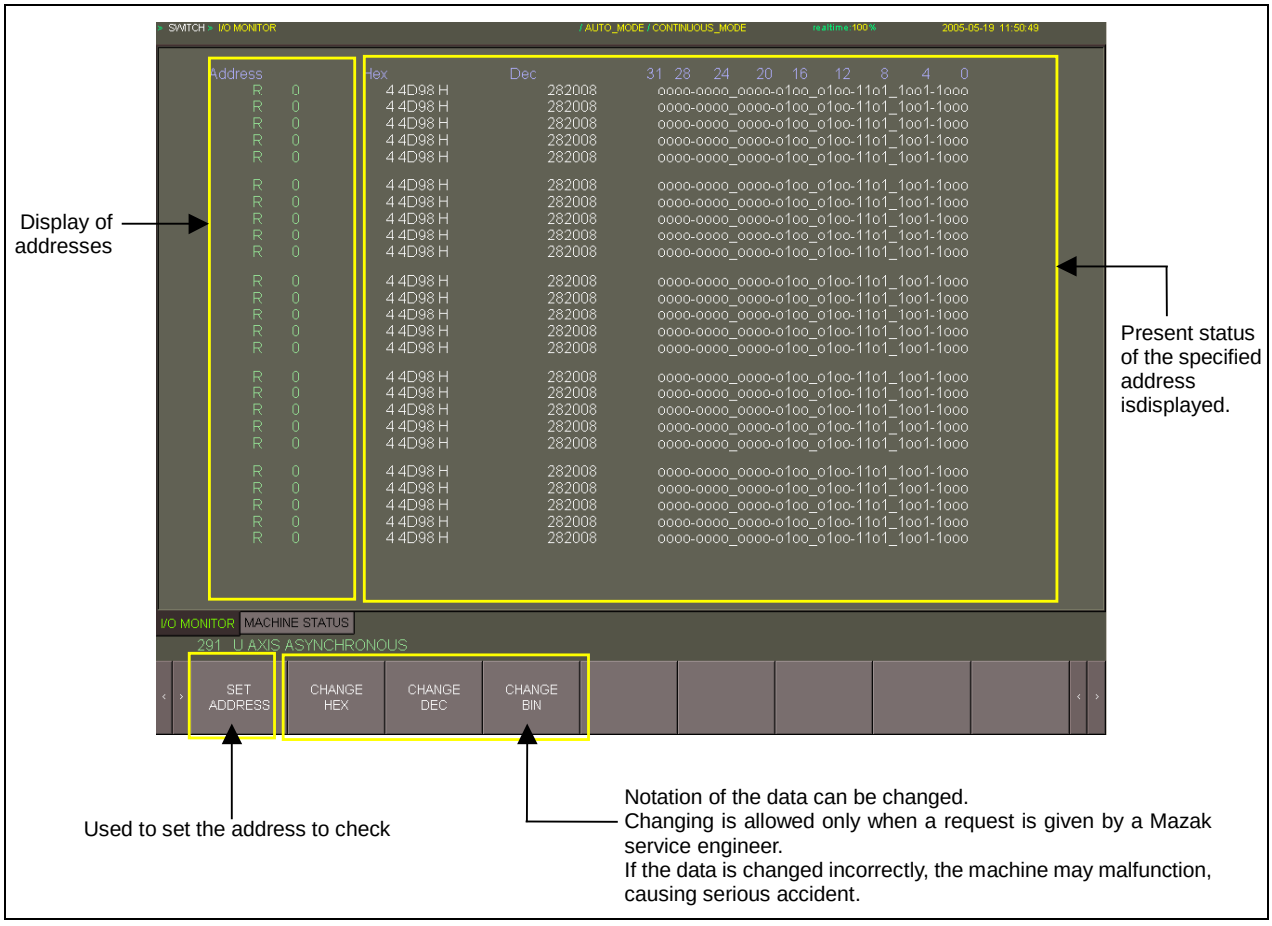
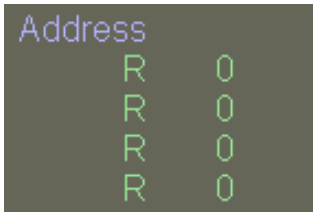

Display of addresses
Present status of the specified address isdisplayed.
I/O MONITOR
MACHINE STATUS
SET ADDRESS
CHANGE HEX
CHANGE DEC
CHANGE BIN
Used to set the address to check
Notation of the data can be changed.
Changing is allowed only when a request is given by a Mazak service engineer.
If the data is changed incorrectly, the machine may malfunction, causing serious accident.

Fig. 3-12

(2) Select the desired location by pressing the [↓] key.



(3) Press the **[SET ADDRESS]** menu key.

➔ The **SET** popup window will open.

(4) Enter the address character, or select the address character by pressing the [↓] key.

Example: Selecting address character “X”

(5) Press the [TAB] key and enter the address directly.

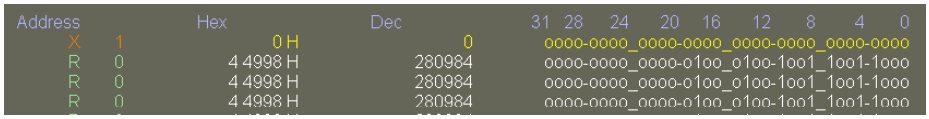
Example: Entering address “1”

(6) Select the **[CONFIRM]** button by pressing the [TAB] key.

(7) Press the [INPUT] key.

➔ The status of the specified address is displayed.

Example: Status of “X1” is displayed.



3-25 Screen Saver Function

After turning the power ON to the CNC, if no operation is performed at the CNC for the length of time set at the user parameter, the screen saver function is activated. The screen saver function is valid whatever NC screen is open.

Note: The screen saver function is supported only by the CNC of v59.08 and above.

1. Screen saver screen

The screen as shown below is displayed when the screen saver function is activated.

2. Parameter

The following parameter sets the waiting time for the screen saver function to be activated.

User Parameter No.	Name	Unit	Enabled	Standard Setting Value
N112	Screen saver waiting time	Min.	Turning off and on the power	20

Note: After changing the setting for this parameter, turn off and on the power to enable the new setting.

3-25-1 Canceling the screen saver function

- The following explains the operation to cancel the screen saver function after the function is activated.

  The following operation is regarded as the operation to cancel the screen saver function and operation itself has no response.

  ➔ Operating the mouse

  ➔ Pressing a screen selection key

  ➔ Pressing an address/numeric key or a cursor key

  ➔ Pressing a menu key

- The following operation cancels the screen saver function and the operation itself calls the corresponding function.

  ➔ Pressing an axis operation button

  ➔ Pressing the Reset button

  ➔ Pressing a laser control button

  ➔ Pressing a mode selection key

  ➔ Pressing a control function selection key

  ➔ Pressing an override key (with an exception of the LASER key)

  Example: If the screen saver function is canceled by pressing the Reset button during automatic operation, the automatic operation stops.

- The following operation does not cancel the screen saver function.

  ➔ Operating the handle

  ➔ Pressing a machine operation button

  ➔ Pressing the LASER key in the override keys.

  ➔ Occurrence of an alarm in the state the screen saver function is active.

3-26 Memorizing/Calling the View (Graphic Display) Setting of Graphic Screen

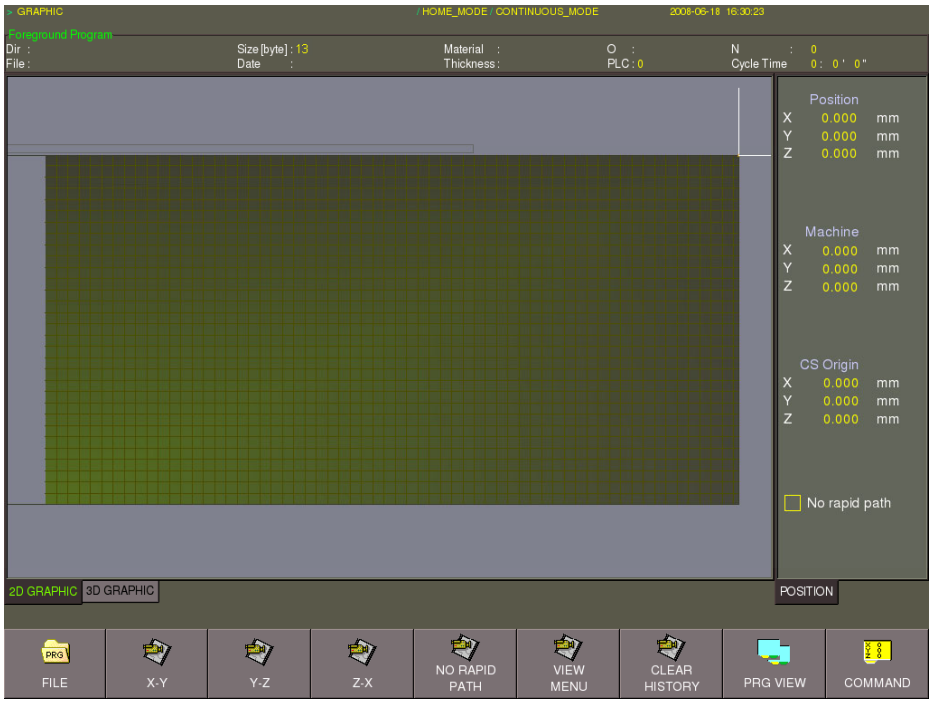
To confirm the tool path on the **GRAPHIC** screen, the size and position of graphic display size can be changed (zoom in/out, pan/rotation) using the mouse. The CNC software of version v59.09 and above can memorize the changed display status and change the graphic display according to the memorized setting of view by pressing the menu key. After changing the graphic display, the previous display can be restored by pressing the menu key.

Note: This function is not supported by the NC software of v59.08 and before.

3-26-1 Memorizing the view setting

(1) Press the [GRAPHIC] key on the operating panel.

➔ The **GRAPHIC** screen will be displayed.



(2) Press the **[VIEW MENU]** menu key.

➔ The menu display changes as shown below.

Note: Pressing the **[RETURN]** menu key restores the previous menu display.

(3) Change the graphic display as required (zoom in/out, pan/rotation) using the mouse.

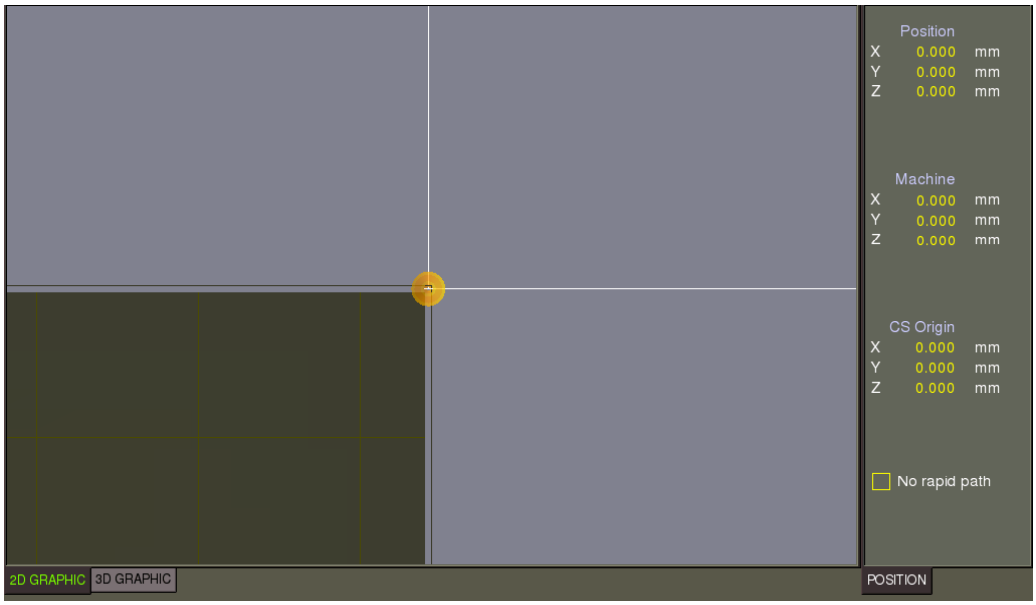
(4) Press the **[MEMORIZE]** menu key.

➔ The confirmation message window will open.

(5) Click the **[CONFIRM]** button, and the current view setting is memorized.

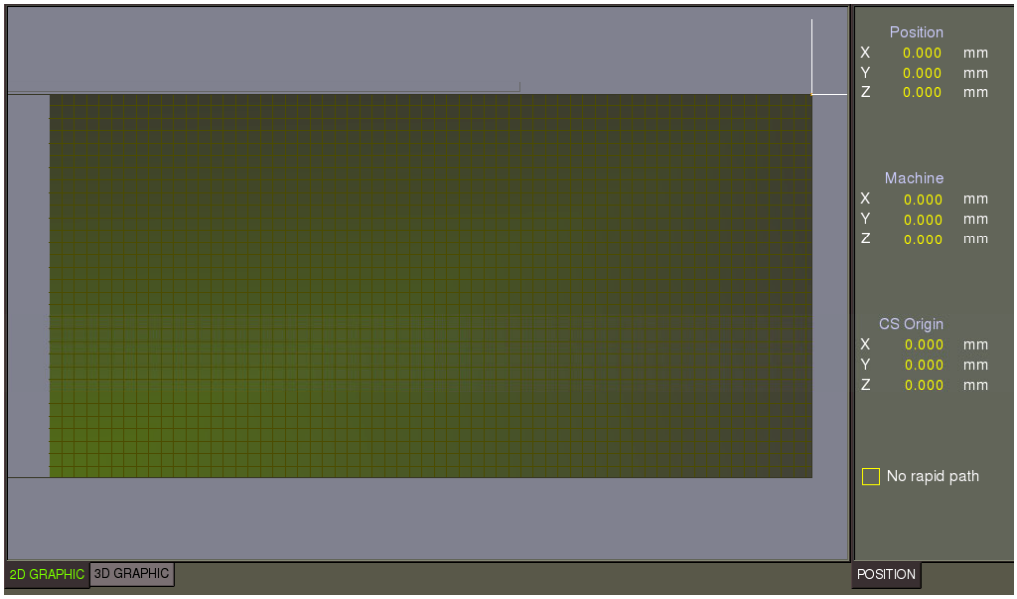
3-26-2 Changing the graphic display using the memorized view setting

(1) Change the graphic display using the mouse.



(2) Press the **[MEM VIEW]** menu key.

➔ The memorized view setting is called and the graphic display on the screen is changed according to the called view setting.



➔ The setting of the graphic display immediately before calling the memorized view setting is stored at the same time. The graphic display can therefore be returned to the previous display by the operation explained below.

(3) Press the **[PREV VIEW]** menu key.

➔ The view setting is returned to the setting valid immediately before the pressing of the **[MEM VIEW]** menu key.

- MEMO -

4 PROGRAMMABLE AUTOMATIC FOCUS SETTING FUNCTION (SERVO FOCUS)

In this manual, the programmable automatic focus setting function is referred to as the servo focus.

The servo focus controls the position of the lens in the torch as an NC axis so that the focus can be easily changed and this feature reduces automatic focus changing time considerably. Since the focus is changed by NC control, the feature can also be used as the cutting technique like changing the focus with laser on.

From the standpoint of the NC, this axis is defined and controlled as the W-axis.

Note: This function is supported by the CNC software version of v60.2 and above.

4-1 Addition of W-axis Related Information on the Screens

Due to the introduction of the servo focus, the W-axis is added to the conventional numerically controlled axes (X, Y and Z) and according to this addition, the W-axis related information is additionally displayed on the following screens. For other screens, display is not changed.

1. POS and VELOCITY pages on the COMMAND screen

Fig. 4-1 **POS** and **VELOCITY** pages on the **COMMAND** screen

2. POSITION screen

Fig. 4-2 **POSITION** screen

3. Tracer adjustment screen

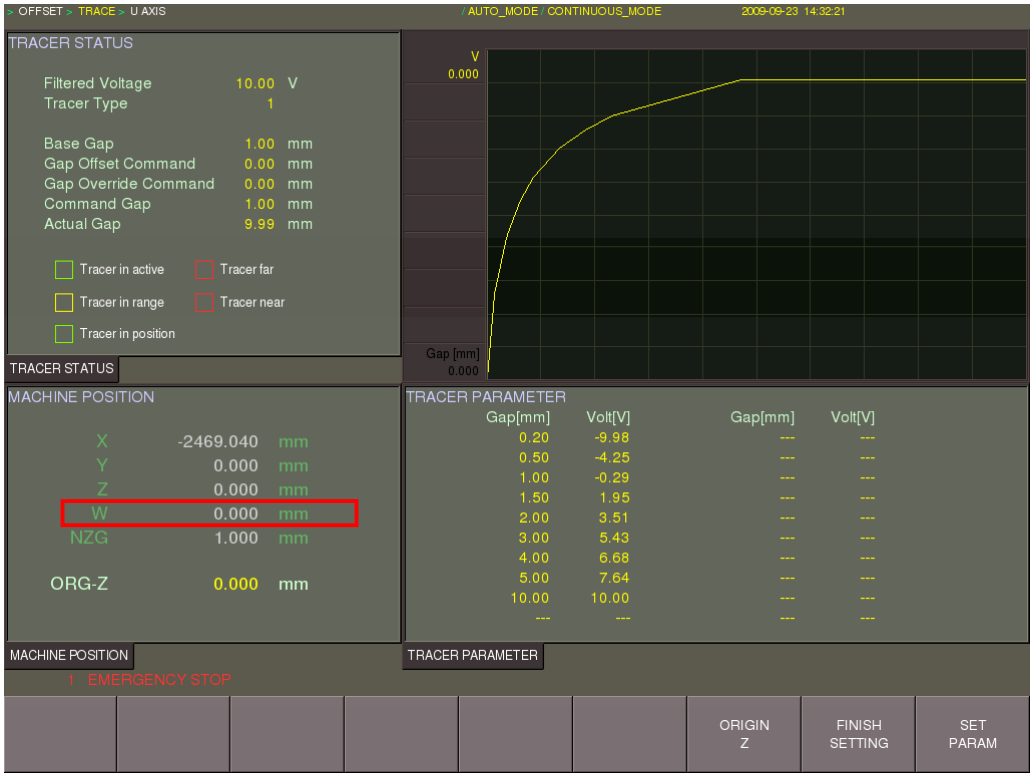


Fig. 4-3 Tracer adjustment screen

4. U-axis adjustment screen (available only for HG series)

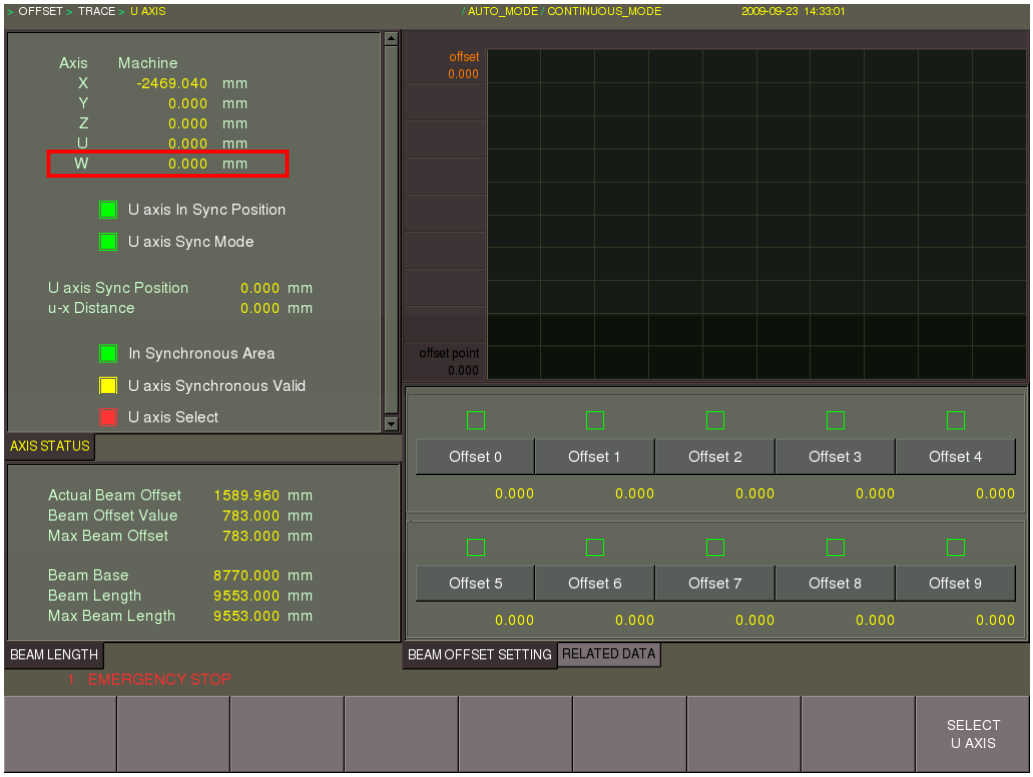


Fig. 4-4 U-axis adjustment screen (available only for HG series)

5. GRAPHIC screen

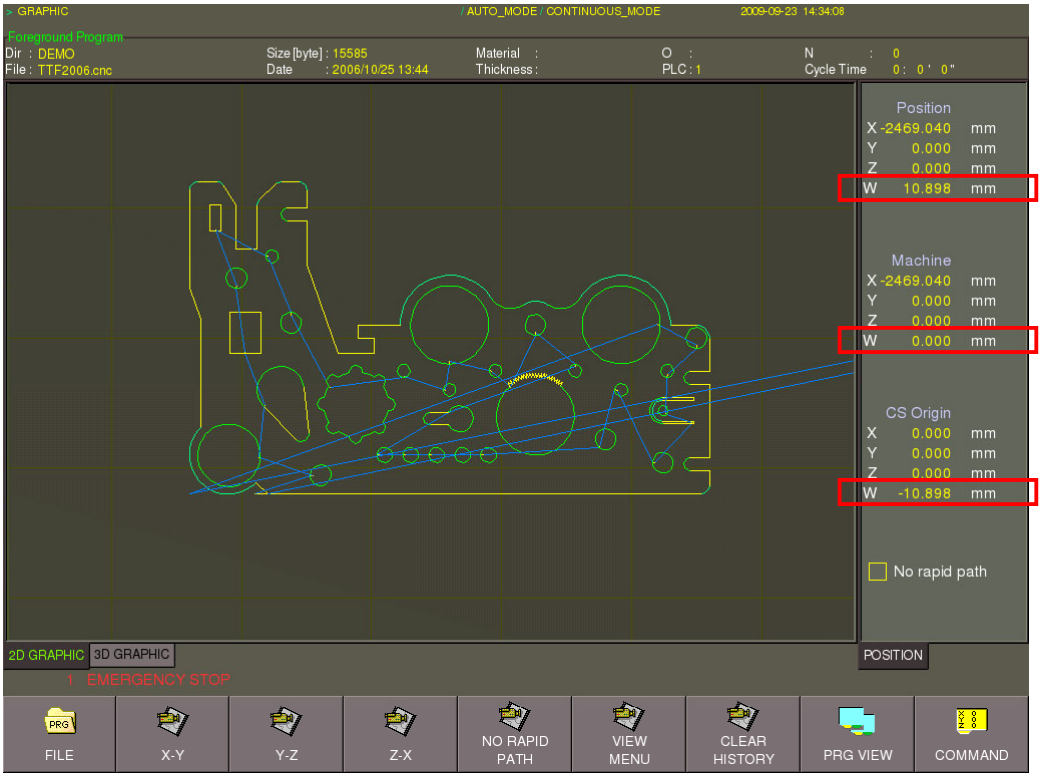


Fig. 4-5 **GRAPHIC** screen

6. VERSION screen

With the HTX series, servo version is displayed up to SV6 due to the addition of the W-axis. With the HG and STX series, servo version display is not changed.

Fig. 4-6 **VERSION** screen